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URBANA

REPORT OF INVESTIGATIONS—NO. 158

ILLINOIS MINERAL INDUSTRY IN 1950

BY

WALTER H. VOSKUIL

PRINTED BY AUTHORITY OF THE STATE OF ILLINOIS

URBANA, ILLINOIS

1952

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This report is a contribution of the Mineral Economics Section.

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September 7, 1951

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ILLINOIS MINERAL INDUSTRY IN 1950

BY

WALTER H. VOSKUIL

ILLINOIS' PLACE of distinction in industrial activity in the Upper Mississippi Valley and the nation rests in no small part upon its mineral industry. The primary materials of industrial production—fuels and iron ore, the latter from the Lake Superior district—are available in abundant quantities and are assembled for processing at a low cost on Lake Michigan near the large market of Chicago and smaller cities in the industrial belt. There are abundant cheaply mined and good quality coals at points accessible to manufacturing centers. In addition to this, certain minerals essential to the processing of primary steel, such as refractory materials and fluxes, are also present in the area, together with a variety of mineral products for foundry, chemical, construction, and other uses.

This unusual and excellent endowment in Illinois of industrial, mineral, and agricultural resources offers opportunities for production and employment that are virtually unmatched elsewhere.

The wide variety of mineral production in the state and the high rank of Illinois among the states in the production of several of these minerals (see table 1) indicates Illinois' important position as a mineral producer.

The mineral industry in Illinois is a source of materials for a wide range of economic activities. Coal and oil, the two leading minerals in value, supply power and fuel for manufacturing industries, rail and automobile transportation, and for mechanical power in agriculture. An abundance of sand, gravel, stone, and cement-making materials contributes to the needs of the construction industries. Not only is Illinois an important producer of minerals, but it also ranks high as a center for the processing of mineral raw materials into primary raw materials for the use of industry.

Minerals for special purposes, such as refractory clays and clays for pottery making, silica sand for glass and other specialized industries, are produced in important quantities. Illinois maintains a leading position in the production of fluorspar, a mineral which is finding an important place in the chemical industries. A summary of the mineral position of Illinois is given in tables 1 and 2, and figure 1.

ACKNOWLEDGMENTS

This report is made possible through the cooperation of the Bureau of Mines of the United States Department of the Interior, the Illinois State Department of Mines and Minerals, and mineral producers throughout Illinois, who furnished information regarding their operations.

Special acknowledgment is made to Miss Ethel M. King, who has assembled the statistics for the report on stone, sand, gravel, clay, and clay products, silica and tripoli; and to W. L. Busch for aid in preparation of the sections on coal, coke, petroleum, natural gas, zinc, lead, and fluorspar.

Each section of this report was prepared in close collaboration with the heads of the several mineral research divisions of the Illinois State Geological Survey. Special assistance and advice were contributed by G. H. Cady, Senior Geologist and Head of the Coal Division; A. H. Bell, Geologist and Head of the Oil and Gas Division; J. E. Lamar, Geologist and Head of the Industrial Minerals Division; F. H. Reed, Chief Chemist and Head of the Geochemistry Section, and G. C. Finger, Chemist and Head of the Fluorspar Division of that Section.

Line No.	Material	Detail table	Unit	1948				
				Quantity	Value at plants		Rank among states	
					Total	Av.	Amt.	Val.
1	*Coal—bituminous*	9	Tons	66,167,000	$256,728,000	$ 3.88	4	4
	Petroleum							
2	Crude Oil	17	Bbls.	64,808,000	179,518,000	2.77	6	6
3	Natural gas—marketed	—	M cu. ft	14,062,000	1,730,000	.123	16	15
4	Natural gas—used in fields	—	M cu. ft.	13,502,000	1,108,000	.082	10	8
5	Natural gasoline	—	Gals.	148,627,000	* 13,426,000	* .09	6	*5
6	Liquefied petroleum gases	—	"					
7				—	* 195,782,000	—		
	Stone, rock products							
8	Limestone and dolomite	27, 28	Tons	18,593,042	23,379,762	1.26	4	3
9	Cement	31	Bbls.	7,875,758	16,078,433	2.04	d*12	d*14
10	Lime	32	Tons	283,090	3,000,225	10.60	7	*8
11	Ganister, sandstone	33	"	200	1,000	5.00		
12				—	42,459,420	—		
	Clays, clay products							
13	Clays (except fuller's earth)	34	Tons	261,205	1,293,385	4.95	4	
14	Fuller's earth	34	"					
15	Clay products—refractories	35	"	262,871	8,281,469	31.50		
16	Structural	35	Eqv.tons	1,780,898	17,200,539	9.66		4
17	Whiteware and pottery	35	—	—	17,924,175	—		
18				—	44,699,568	—		
	Sand and Gravel							
19	Silica sand	37	Tons	2,504,528	4,795,569	1.91	1	1
20	Other sand	36	"	5,738,402	4,133,668	.72		
21	Gravel	36	"	9,353,275	6,059,445	.65		
22				17,596,205	14,988,682	.85	4	4
	Silica and tripoli							
23	Ground silica	38	Tons	222,827	1,864,585	8.37	1	1
24	Tripoli ("amorphous" silica)	39	"	(e)	(e)	—	2	2
25				222,827	1,864,585	8.37		
26	*Fluorspar*	41	Tons	172,561	6,322,246	36.64	1	1
	Metals							
27	Zinc	—	Tons	12,980	3,452,680	266.00	14	14
28	Lead	—	"	3,695	1,322,810	358.00	14	14
29	Silver	—	Troy ozs.	4,047	3,663	0.905	*17	*17
30				—	4,779,153	—		
31	*Annual Mineral Production*			—	* 567,623,654	—		
	Minerals processed, but mostly not mined in Illinois							
32	Coke produced and by-products sold	14	—	—	66,229,000	—		6
33	Pigiron produced	—	Tons	5,512,781	196,916,537	35.72	4	4
34	Slab zinc	—	"	93,229	24,798,914	266.00	4	4
35	Miscellaneous minerals	—	—	—	3,921,816	—		
36	*Total minerals processed*			—	291,866,267	—		
37	*Total minerals produced and processed*			—	*$859,489,921	—		

* Revised figures.
[a] Compiled from various sources, as stated in each table. See footnotes for each table.
[b] Estimated.

ILLINOIS, SOLD OR USED BY PRODUCERS, 1948–1950[a]

1949*					1950[c]					
Quantity	Value at plants		Rank among states		Quantity	Value at plants		Percent change in quantity from 1949	Percent change in value from 1949	Line No.
	Total	Av.	Amt	Val.		Total	Av.			
47,630,000	$192,426,000	$4.04	4	4	57,282,000	$236,576,000	$4.13	+ 20.3	+ 22.9	1
64,501,000	178,668,000	2.77	6	6	61,922,000	171,524,000	2.77	− 4.0	− 4.0	2
[b]13,500,000	[b]1,728,000	[b].128			[b]13,700,000	[b] 1,822,000	[b] .133	+ 1.5	+ 5.0	3
[b]10,000,000	[b] 850,000	[b].085			[b]12,000,000	[b] 1,080,000	[b] .090	+ 20.0	+ 27.0	4
135,147,000	[b]7,298,000	[b].054	7		129,701,000	[b] 6,615,000	[b] .051	− 4.0	− 9.0	5
										6
—	188,544,000	—			—	181,041,000	—	—	− 4.0	7
17,300,130	21,328,699	1.23	3	3	18,027,692	21,762,655	1.21	+ 4.2	+ 2.0	8
8,200,148	17,340,782	2.11			8,145,885	17,810,417	2.19	− 0.7	+ 2.7	9
276,161	3,197,890	11.58	7	7	367,485	4,465,413	12.15	+ 33.1	+ 39.6	10
830	9,378	11.30			4,081	11,781	2.89	+391.7	+ 25.6	11
—	41,876,749	—			—	44,050,266	—	—	+ 5.2	12
210,294	994,751	4.73	4		237,957	1,178,017	4.95	+ 13.2	+ 18.4	13
					—	—	—	—	—	14
214,277	7,622,047	35.57			253,053	9,227,648	36.46	+ 18.1	+ 21.1	15
1,481,850	15,077,840	10.18			1,782,170	18,707,755	10.50	+ 20.3	+ 24.1	16
—	14,381,373	—			—	20,019,908	—	—	+ 39.2	17
—	38,076,011	—			—	49,133,328	—	—	+ 29.0	18
1,990,122	4,138,336	2.08	1	1	2,322,657	4,958,300	2.13	+ 16.7	+ 19.8	19
6,767,406	5,007,363	.74			6,693,370	5,097,166	.76	− 1.1	+ 1.9	20
8,510,918	5,516,198	.65			8,665,421	5,888,906	.68	+ 1.8	+ 6.8	21
17,268,446	14,661,897	.85	4	3	17,681,448	15,944,372	.91	+ 2.4	+ 8.7	22
217,577	1,887,145	8.67	1	1	263,122	2,278,237	8.66	+ 20.9	+ 20.7	23
[e]	[e]	—	2	2	[e]	[e]	—	—	—	24
217,577	1,887,145	8.67			263,122	2,278,237	8.66	+ 20.9	+ 20.7	25
120,881	4,621,733	38.23	1	1	154,623	6,110,765	39.52	+ 28.0	+ 32.2	26
18,157	4,502,936	248.00	13	13	[b] 24,000	[b] 6,672,000	[b]278.00	+ 32.0	+ 48.0	27
3,824	1,208,384	316.00	13	13	[b] 3,000	[b] 750,000	[b]250.00	− 22.0	− 38.0	28
3,128	2,831	0.905	17	17	[b] 1,800	[b] 1,629	[b] 0.905	− 42.0	− 42.0	29
—	5,714,151	—			—	7,423,629	—	—	+ 29.9	30
—	487,807,686	—			—	542,557,597	—	—	+ 11.2	31
—	62,253,000	—		6	—	69,619,000	—	—	+ 12.0	32
4,912,810	204,815,049	41.69	4	4	[b] 5,893,600	[b]265,212,000	[b] 45.00	+ 20.0	+ 30.0	33
86,823	21,532,104	248.00	4	4	[b] 109,000	[b] 28,340,000	[b]260.00	+ 26.0	+ 32.0	34
—	5,051,666	—			—	6,652,589	—	—	+ 31.7	35
—	293,651,819	—			—	369,823,589	—	—	+ 26.0	36
—	$781,459,505	—			—	$912,381,186	—	—	+ 16.8	37

[c] Subject to revision.
[d] Rank among districts.
[e] As there were less than three producers, production figures cannot be shown without revealing individual operations.

TABLE 2.—VALUE OF ILLINOIS MINERAL PRODUCTION, 1914–1950[a]
(Thousands of dollars)

Year	Mineral production	Minerals processed, but mostly not mined, in Illinois	Total minerals produced and processed
1914	$117,166	$ 44,843	$162,009
15	114,446	82,871	197,317
1916	146,360	130,082	276,442
17	234,736	144,754	379,490
18	271,244	149,740	420,984
19	213,701	95,077	308,778
20	373,926	137,228	511,154
1921	254,019	54,136	308,155
22	244,618	85,820	330,438
23	282,761	142,131	424,892
24	235,796	95,506	331,302
25	231,658	118,702	350,360
1926	237,242	119,642	356,884
27	180,394	105,099	285,493
28	188,099	110,622	298,721
29	182,791	125,516	308,307
30	148,311	89,303	237,614
1931	108,066	52,014	160,080
32	71,693	24,385	96,078
33	74,837	34,786	109,623
34	89,212	41,405	130,617
35	96,484	57,038	153,522
1936	117,916	78,693	196,609
37	133,437	104,359	237,796
38	130,155	50,482	180,637
39	215,157	86,324	301,481
40	287,327	114,814	402,141
1941	333,225	168,338	501,563
42	341,835	199,281	541,116
43	337,912	221,939	559,851
44	342,832	206,833	549,666
45	344,267	193,658	537,925
1946	379,673	183,491	563,164
47	458,734	264,652	723,386
48	*567,624	291,866	*859,490
49	*487,808	*293,652	*781,460
50	542,557	369,824	912,381

* Revised figures.

[a] Compiled from following sources:
For years 1914—1922, incl. — U. S. Geological Survey, Mineral Resources of United States.
1923—1931, " — U. S. Bureau of Mines, Mineral Resources of United States.
1932—1938, " — U. S. Bureau of Mines, Minerals Yearbooks.
1939—1950, " — Summary of canvass made by Illinois Geological Survey and U. S. Bureau of Mines, and from Minerals Yearbooks.

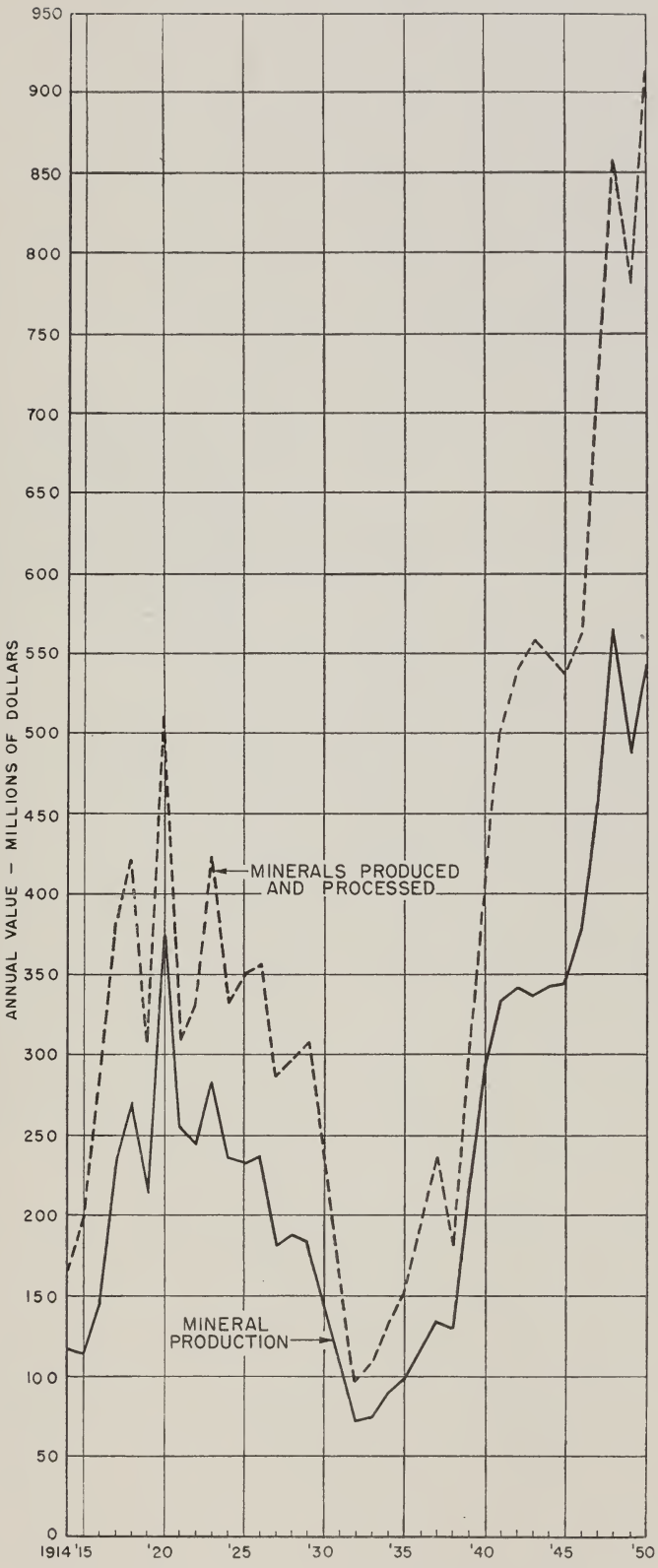

FIG. 1.—Value of annual mineral production in Illinois.

COAL

Developments in 1950

In the latter part of 1950 new rail-to-water coal-handling equipment was put into operation by Rail to Water Transfer Corp. in Chicago's south-side lake port district. This is an important addition to Chicago's port facilities in expediting the movement of midwestern coals to northern lake ports of Canada, Minnesota, Wisconsin, and Michigan. The new machine can load coal into ships up to the rate of 2,200 tons per hour. Annual tonnage at the dock runs to some 2,500,000 tons.

Rail to Water Transfer Corp. is owned by 28 coal mining companies and shippers dealing exclusively in midwestern coals.

Bituminous Coal Research has reported progress on development of the coal-fired gas turbines for locomotive use. Research on this type of prime mover has reached the stage of testing in service.

Coal consumption by railroads dropped off with the further installation of oil-burning diesel locomotives. The change from 1941 to 1949 to 1950 in use of coal was as follows:

1941—107,584,000 tons of coal
1949— 66,920,000 tons of coal
1950— 65,865,000 tons of coal

Production in 1950

The record of coal production through a ten-year period of both war and peace is reported in table 3. Production in 1950, of 512 million tons, is practically the same as 1941, of 514 million tons, although the Federal Reserve Board Index of production was 22.2 percent higher in 1950 than 1941. Meanwhile, average mine output during the decade ending in 1950, which included the war years, was 560 million tons. This is 9.4 percent above the output of 1950.

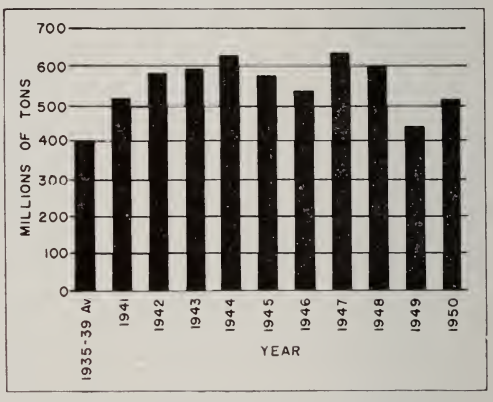

Fig. 2.—National production of bituminous coal, 1941–1950, compared with the 1935–1939 average production.

Production by Districts

Coal production by districts is shown in table 5 for three years. Of particular interest are districts east of the Mississippi River which produce more than 90 percent of the bituminous coal output. Although competition among producing districts in price areas is keen, there is a certain degree of market specialization among the several districts, based mainly on the characteristics of the coal.

Table 3.—National Production of Bituminous Coal, 1941–1950[a]
(Thousands of tons)

Year	Amount	Percent of change by years	Year	Amount	Percent of change by years
1941	514,149		1946	533,922	− 7.6
1942	582,693	+ 13.3	1947	630,624	+ 18.1
1943	590,177	+ 1.3	1948	599,518	− 4.9
1944	619,576	+ 5.0	*1949	437,868	− 27.0
1945	577,617	− 6.8	[b]1950	512,000	+ 17.0

* Revised figures.
[a] Source: U. S. Bureau of Mines.
[b] Preliminary figures.

Districts 2, 7, and 8 (fig. 4) supply coking coal for the blast furnaces and also a high percentage of fuel used for domestic heating. These two markets are, in a sense, complementary. Coal suitable for coking is also excellent for domestic fuel. The small sizes and screenings are used by the coking market, and the prepared sizes find a ready outlet as domestic fuel over a large area.

Districts 3, 4, 6, and 9 (fig. 4) market one-third or more of their output as railroad fuel, and the remaining districts distribute their output among manufacturing industries, utilities, railroads, and retail yards.

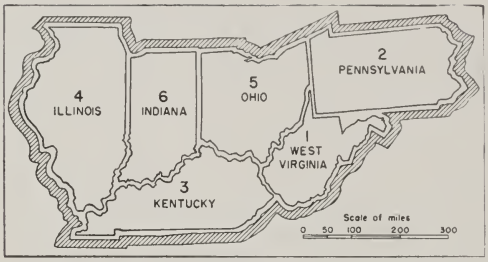

FIG. 3.—The six states which produced 84% of the nation's bituminous coal in 1949.

TABLE 4.—BITUMINOUS COAL PRODUCTION IN THE UNITED STATES BY STATES, 1946–1950[a]
(Thousands of tons)

State	1946	1947	1948	1949*	1950[b]
Alabama	16,183	19,048	18,801	12,934	15,130
Alaska	367	361	408	434	393
Arkansas	1,631	1,871	1,662	962	1,016
Colorado	5,914	6,358	5,631	4,636	4,285
Illinois	63,469	67,860	65,342	47,208	55,346
Indiana	21,697	25,449	23,849	16,550	20,370
Iowa	1,788	1,684	1,670	1,725	1,900
Kansas	2,493	2,745	2,538	2,031	1,722
Kentucky	66,553	84,241	82,084	62,583	77,900
Maryland	2,003	2,051	1,661	668	500
Missouri	3,733	4,236	4,022	3,647	3,088
Montana	3,723	3,178	2,898	2,766	2,466
New Mexico	1,280	1,443	1,364	1,004	667
North Dakota	2,555	2,760	2,961	2,967	[c]3,220
Ohio	32,314	37,548	38,708	30,961	36,946
Oklahoma	2,647	3,421	3,462	3,022	3,050
Pennsylvania	125,497	147,079	134,542	89,215	102,500
Tennessee	5,618	6,258	6,483	4,172	5,100
Texas	56	61	57	49	20
Utah	5,994	7,429	6,813	6,160	6,340
Virginia	15,527	20,171	17,999	14,584	17,700
Washington	991	1,118	1,220	899	872
West Virginia	144,020	176,157	168,862	122,610	145,565
Wyoming	7,635	8,051	6,412	6,001	5,860
Other States	234	46	69	80	44
Total	533,922	630,624	599,518	437,868	512,000

* Revised figures.
[a] Source: U. S. Bureau of Mines.
[b] Preliminary figures.
[c] Includes South Dakota for 1950.

TABLE 5.—PRODUCTION OF BITUMINOUS COAL BY DISTRICTS, 1948–1950[a]
(Thousands of tons)

District	1948		1949*		1950[b]	
	Amount	Percent of total	Amount	Percent of total	Amount	Percent of total
1. Eastern Pennsylvania	60,046	10.0	39,659	9.1	46,254	9.0
2. Western Pennsylvania	77,215	12.9	50,652	11.6	57,426	11.2
3. Northern West Virginia	47,706	8.0	36,920	8.4	40,933	8.0
4. Ohio	38,708	6.4	30,961	7.1	36,946	7.2
5. Michigan 6. Panhandle	4,754	0.8	3,707	0.8	4,220	0.8
7. Southern Numbered 1	60,483	10.1	41,508	9.5	50,342	9.8
8. Southern Numbered 2	137,706	23.0	102,695	23.4	127,096	24.8
9. West Kentucky	22,397	3.7	18,029	4.1	22,000	4.3
10. Illinois	65,342	10.9	47,208	10.8	55,346	10.8
11. Indiana	23,849	4.0	16,550	3.8	20,370	4.0
12. Iowa	1,670	0.3	1,725	0.4	1,900	0.4
13. Southeastern	20,159	3.3	13,638	3.1	16,168	3.2
Total—All Eastern Districts	560,035		403,252		479,001	
Percent of U. S. Total		93.4		92.1		93.5
Total—United States	599,518		437,868		512,000	

* Revised figures.
[a] Source: U. S. Bureau of Mines.
[b] Preliminary figures.

TABLE 6.—PRODUCTION OF BITUMINOUS COAL IN THE EASTERN INTERIOR COAL FIELD, 1946–1950[a]
(Thousands of tons)

Year	Illinois		Indiana		West Kentucky		Total
	Amount	Percent[b]	Amount	Percent[b]	Amount	Percent[b]	
1946	63,469	62.0	21,697	21.2	17,211	16.8	102,377
1947	67,860	58.8	25,449	22.0	22,182	19.2	115,491
1948	65,342	58.5	23,849	21.4	22,397	20.1	111,588
1949*	47,208	57.7	16,550	20.3	18,029	22.0	81,787
1959[c]	55,346	56.6	20,370	20.9	22,000	22.5	97,716

* Revised figures.
[a] Source: U. S. Bureau of Mines.
[b] Percent of total in Eastern Interior Coal Field.
[c] Preliminary figures.

TABLE 7.—ILLINOIS COAL PRODUCTION BY COUNTIES, 1882–1950[a]
(In tons)

County	Production	County	Production
Adams	46,186	Mercer	14,997,932
Bond	7,355,569	Monroe	8,284
Brown	57,324	Montgomery	77,860,091
Bureau	48,274,097	Morgan	190,523
Calhoun	96,247	Moultrie	2,032,236
Cass	212,477	Peoria	64,150,659
Christian	185,382,537	Perry	144,732,902
Clinton	37,648,217	Pike	5,081
Coles	198,932	Pope	1,562
Crawford	44,786	Putnam	10,071,893
Douglas	331,460	Randolph	61,640,014
Edgar	898,955	Richland	154
Effingham	796	Rock Island	3,846,169
Franklin	445,261,090	St. Clair	209,332,133
Fulton	151,114,911	Saline	176,249,598
Gallatin	4,131,116	Sangamon	231,271,073
Greene	621,697	Schuyler	2,842,687
Grundy	40,066,536	Scott	612,476
Hamilton	22,097	Shelby	4,119,763
Hancock	532,418	Stark	1,226,502
Hardin	40	Tazewell	17,522,855
Henry	19,346,863	Vermilion	146,264,328
Jackson	77,109,103	Wabash	186,144
Jasper	23,739	Warren	679,794
Jefferson	6,548,215	Washington	17,660,726
Jersey	119,960	White	1,676,741
Johnson	242,109	Will	35,860,403
Kankakee	2,304,119	Williamson	276,899,752
Knox	22,037,308	Woodford	7,807,621
LaSalle	65,451,192	Total (1882–1950)	3,140,759,659
Livingston	10,085,742	Estimated production (1833–1881)	73,386,123
Logan	14,085,371	Total production (1833–1950)	3,214,145,782
Macon	11,000,468		
Macoupin	255,340,335		
McDonough	2,634,755		
McLean	5,544,139		
Madison	152,697,525		
Marion	38,352,203		
Marshall	12,515,631		
Menard	13,273,298		

[a] Source: Illinois State Department of Mines and Minerals.

TABLE 8.—COAL PRODUCTION OF ALL ILLINOIS
(In

County	Shipping Mines			
	Number of mines	Tons mined underground	Tons mined strip	Total tons mined
Brown	—	—	—	—
Bureau	—	—	—	—
Christian	5	8,375,600	—	8,375,600
Clinton	2	247,331	—	247,331
Douglas	1	90,479	—	90,479
Edgar	—	—	—	—
Franklin	11	9,154,688	—	9,154,688
Fulton	11	106,081	5,730,881	5,836,962
Gallatin	2	62,139	—	62,139
Greene	—	—	—	—
Grundy	—	—	—	—
Hancock	1	—	40,446	40,446
Henry	3	154,237	692,523	846,760
Jackson	8	455,961	711,752	1,167,713
Jefferson	2	499,042	—	499,042
Jersey	—	—	—	—
Kankakee	1	—	355,333	355,333
Knox	3	19,617	1,219,193	1,238,810
LaSalle	—	—	—	—
Livingston	—	—	—	—
Logan	—	—	—	—
Macoupin	9	3,301,308	—	3,301,308
Madison	4	1,260,558	—	1,260,558
Marion	1	226,531	—	226,531
Marshall	—	—	—	—
Menard	—	—	—	—
Mercer	—	—	—	—
Montgomery	1	746,046	—	746,046
Morgan	—	—	—	—
Peoria	1	340,526	—	340,526
Perry	8	1,926,346	2,984,828	4,911,174
Randolph	3	598,511	1,073,177	1,671,688
St. Clair	9	2,044,140	754,182	2,798,322
Saline	11	3,414,334	355,888	3,770,222
Sangamon	3	1,284,455	—	1,284,455
Schuyler	—	—	—	—
Shelby	—	—	—	—
Stark	—	—	—	—
Tazewell	—	—	—	—
Vermilion	2	—	553,719	553,719
Warren	—	—	—	—
Washington	1	19,903	—	19,903
Will	2	—	920,411	920,411
Williamson	44	3,559,959	1,076,793	4,636,752
Woodford	—	—	—	—
Total	149	37,887,792	16,469,126	54,356,918

[a] Source: Illinois State Department of Mines and Minerals.

MINES BY TYPE OF MINE AND BY COUNTIES, 1950[a]
tons)

Local mines				County totals		
Number of mines	Tons mined underground	Tons mined strip	Total tons mined	Number of mines	Total tons mined	Percent of state total
1	—	207	207	1	207	—
2	—	31,113	31,113	2	31,113	.05
—	—	—	—	5	8,375,600	14.62
—	—	—	—	2	247,331	.43
—	—	—	—	1	90,479	.16
1	18,411	—	18,411	1	18,411	.03
—	—	—	—	11	9,154,688	15.98
25	153,697	100,120	253,817	36	6,090,779	10.63
9	9,019	—	9,019	11	71,158	.12
1	—	930	930	1	930	—
2	7,990	37,218	45,208	2	45,208	.08
—	—	—	—	1	40,446	.07
2	20,188	—	20,188	5	866,948	1.51
7	37,151	3,426	40,577	15	1,208,290	2.11
—	—	—	—	2	499,042	.87
1	—	660	660	1	660	—
—	—	—	—	1	355,333	.62
1	93,082	—	93,082	4	1,331,892	2.33
11	21,007	23,730	44,737	11	44,737	.08
2	—	7,267	7,267	2	7,267	.01
1	49,920	—	49,920	1	49,920	.09
—	—	—	—	9	3,301,308	5.76
6	229,087	—	229,087	10	1,489,645	2.60
—	—	—	—	1	226,531	.39
4	1,044	1,103	2,147	4	2,147	—
5	31,584	—	31,584	5	31,584	.06
2	900	2,844	3,744	2	3,744	.01
—	—	—	—	1	746,046	1.30
2	—	9,069	9,069	2	9,069	.02
34	236,657	61,549	298,206	35	638,732	1.12
3	12,171	—	12,171	11	4,923,345	8.60
3	17,733	—	17,733	6	1,689,421	2.95
13	139,194	802,720	941,914	22	3,740,236	6.53
8	46,727	—	46,727	19	3,816,949	6.66
5	213,957	—	213,957	8	1,498,412	2.62
10	20,434	25,987	46,421	10	46,421	.08
1	16	—	16	1	16	—
1	120	—	120	1	120	—
2	73,714	—	73,714	2	73,714	.13
19	149,489	56,125	205,614	21	759,333	1.33
1	2,996	—	2,996	1	2,996	—
2	21,163	—	21,163	3	41,066	.07
—	—	—	—	2	920,411	1.61
13	132,751	7,272	140,023	57	4,776,775	8.34
1	13,843	—	13,843	1	13,843	.02
					(Other)	.01
201	1,754,045	1,171,340	2,925,385	350	57,282,303	100.00

Table 9.—Summary of Amount and Value of Coal Produced in Illinois, 1949–1950[a]

Type of mine	1949				1950			
	Number of mines	Net tons Produced	Percent of total tons	Av. value at mines[b, c]	Number of mines	Net tons produced	Percent of total tons	Av. value at mines[b, c]
Strip mines								
Shipping	45	12,835,980	26.95	$ 51,857	39	16,469,126	28.75	$ 68,017
Local	43	1,116,222	2.34	4,509	64	1,171,340	2.05	4,838
Total	88	13,952,202	29.29	56,366	103	17,640,466	30.80	72,855
Underground mines								
Shipping	112	31,936,637	67.05	129,024	110	37,887,792	66.14	156,476
Local	137	1,741,541	3.66	7,036	137	1,754,045	3.06	7,244
Total	249	33,678,178	70.71	136,060	247	39,641,837	69.20	163,720
Grand total	337	47,630,380	100.0	192,426	350	57,282,303	100.0	236,575
Average value per ton[c]				$4.04				[d]$4.13

[a] Source: Illinois State Department of Mines and Minerals.
[b] Value in thousands of dollars.
[c] Based on U. S. Bureau of Mines average value per ton for Illinois.
[d] Preliminary figures.

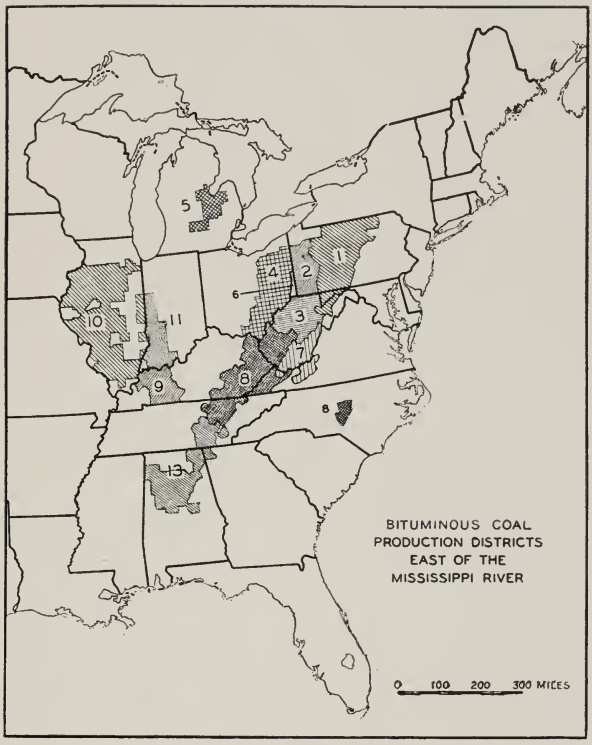

FIG. 4.—Bituminous coal production districts east of the Mississippi River.

TABLE 10.—PRODUCTION OF SHIPPING COAL MINES BY FREIGHT RATE DISTRICTS IN ILLINOIS, 1948–1949[a, b]

District	1948		1949	
	Tons	Percent of total	Tons	Percent of total
Alpha	88,351	0.1	111,804	0.3
Augusta	—	—	53,727	0.1
Belleville	8,559,061	13.7	6,523,019	14.5
Centralia	701,810	1.1	150,629	0.4
Danville	153,994	0.2	471,179	1.1
Duquoin	3,356,526	5.4	2,328,009	5.2
Fulton-Peoria	7,441,279	11.9	5,416,449	12.1
Mineral-Atkinson	694,720	1.1	488,644	1.1
Murdock	114,311	0.2	75,953	0.2
Northern Illinois	1,914,925	3.1	1,200,424	2.7
Rushville	127,308	0.2	19,214	—
Southern Illinois	22,558,845	36.1	15,815,306	35.3
Springfield	16,155,656	25.9	11,750,655	26.2
Victoria	606,597	1.0	364,053	0.8
Other	21,029	—	3,552	—
Total	62,494,412	100.0	44,772,617	100.0

[a] Source: Illinois Dept. of Mines and Minerals for tonnage figures; freight rate districts from Illinois Geological Survey Coal Map, 1947, by G. H. Cady.
[b] Subject to revision.

TABLE 11.—SUMMARY OF DATA CONCERNING ILLINOIS COAL SEAMS[a]

	Coal Seam Number						Total
	One	Two	Three	Five	Six	Seven	
Number of:							
Counties	6	11	3	15	23	7	65
Mines	9	25	4	148	127	24	337
Kind of Opening:			Thousands of tons				
Shaft	250.1	27.5	12.5	2,753.3	23,503.8	12.5	26,559.7
Drift	—	15.0	—	303.2	394.6	.1	712.9
Slope	3.5	6.2	—	3,349.2	2,923.6	123.1	6,405.6
Strip	4.2	1,313.9	4.0	5,216.4	6,922.1	491.6	13,952.2
Manner of Work:			Number of mines				
Pillar and Room	8	7	2	118	98	14	247
Longwall	—	2	—	—	—	—	2
Strip	1	16	2	30	27	12	88
Total production (in thousands of tons)	257.8	1,362.6	16.5	11,622.1	33,744.1	627.3	47,630.4

[a] Source: Illinois State Department of Mines and Minerals, Coal Report for 1949.

TABLE 12.—COAL MINE PRICES PER TON, DECEMBER 1949–1950[a]

	1949	1950
Southern Illinois: Freight[b]	$2.97	$2.97
Lump, Furnace	5.25 — 5.50	5.55 — 5.60
Egg, Stove	5.00 — 5.25	5.30
Stoker (domestic)	5.75 — 5.90	5.90 — 6.10
Stoker (commercial)	4.75 — 5.25	5.15
Screenings (washed)	4.90 — 5.00	5.15
Central Illinois: Freight	$2.64	$2.64
Lump, Egg	4.85 — 5.05	4.75 — 4.95
Stoker	4.50 — 4.90	4.50 — 4.70
Screenings (regular)	3.75 — 4.20	4.00
Belleville Illinois: Freight	—	$2.86
Lump, Egg	—	4.50 — 4.75
Nut	—	4.50
Stoker (domestic)	—	4.65 — 4.90
Stoker (commercial)	—	4.50 — 4.80
Screenings	—	4.00
Indiana No. 4: Freight	$2.51 —$2.64	$2.51 —$2.64
Lump, Egg	4.85	5.00 — 5.50
Stoker	5.50	5.25 — 5.50
Screenings	4.25 — 4.50	4.25
Indiana No. 5: Freight	$2.51 —$2.81	$2.51 —$2.81
Lump, Egg	4.50 — 4.75	4.25 — 6.00
Stoker	4.25 — 4.75	4.50 — 6.00
Screenings	3.75	4.25 — 4.50
West Kentucky No. 6 (washed): Freight	$3.30	$3.30
Stoker (domestic)	5.80 — 5.95	6.05
Stoker (commercial)	5.15 — 5.30	5.50
Screenings	4.95	5.50
West Kentucky No. 9 (washed): Freight	$3.30	$3.30
Lump	4.60	4.70
Egg	4.50	4.60
Nut	4.35	4.25 — 4.35
Stoker (domestic)	—	4.85
Stoker (commercial)	—	4.25
Screenings	4.00 — 4.15	4.25
West Kentucky No. 11 (washed): Freight	$3.30	$3.30
Egg	4.50	4.60
Stoker (domestic)	4.75 — 4.90	5.00
Stoker (commercial)	4.50 — 4.65	4.25 — 4.50
Screenings	4.00 — 4.15	4.25
New River and Pocahontas: Freight	$4.44	$4.44
Lump, Egg, Stove	7.75 — 8.25	7.75 — 8.50
Nut	7.00 — 7.25	6.75 — 7.25
Pea	7.00 — 7.25	7.00 — 7.75
Mine run	7.25 — 7.60	7.50 — 7.75
E. Kentucky, W. Virginia High Volatile: Freight	$4.25	$4.25
Block	7.10 — 8.25	7.00 — 7.75
Furnace	6.60 — 7.75	6.60 — 7.35
Egg	6.05 — 7.75	6.00 — 7.00
Stoker (domestic)	7.25 — 9.00	7.25 — 8.25
Stoker (commercial)	6.25 — 7.25	6.50

[a] Source: Chicago Journal of Commerce.
[b] Freight rates to Chicago, per ton. Add 4 cents per ton federal transportation tax. Freight rates as of December.

TABLE 13.—UNITED STATES EXPORTS OF BITUMINOUS COAL, 1941–1950[a]
(Thousands of tons)

Year	Amount	Year	Amount
1941	20,740.5	1946	41,208.6
1942	22,943.3	1947	68,667.0
1943	25,836.2	1948	45,930.1
1944	26,032.3	1949	27,842.1
1945	27,956.2	1950[b]	25,468.4

[a] Source: U. S. Bureau of Mines.
[b] Preliminary figures.

UPPER MISSISSIPPI VALLEY

The Upper Mississippi Valley coal market area includes Illinois, Indiana, Wisconsin, Minnesota, Iowa, Missouri, the eastern Dakotas, and Kansas. The coal marketed in this area comes from the Eastern Interior coal field in the states of Illinois, Indiana, and western Kentucky, and from the Appalachian districts of Pennsylvania, West Virginia, eastern Kentucky, and Ohio. Coal is distributed by rail, rail-lake, rail-river, and truck.

The coal requirements of the Upper Mississippi Valley include fuel for domestic heating, fuel for general industrial purposes, fuel for rail transportation, and coal for the manufacture of metallurgical coke. Competitive conditions for the several producing districts in the Appalachian fields and in the Eastern Interior districts of Illinois, Indiana, and western Kentucky vary from the keenly competitive industrial and railroad fuel markets to the less competitive domestic fuel trade and by-product coal market.

EASTERN INTERIOR BASIN

Table 6 shows coal production in the Eastern Interior coal basin for the years 1946–50 inclusive. The production history of three competitive districts in Illinois, Indiana, and western Kentucky and the contribution of each to the total production of the Eastern Interior basin from 1913 to 1942 are shown in table 4 of "Illinois Mineral Industry in 1942."[1]

CUMULATIVE COAL PRODUCTION

Table 7 gives cumulative coal production for Illinois, by counties, for the period 1882–1950, as compiled from the annual Coal Reports of the Department of Mines and Minerals, with an estimate of production for the period 1833–1881. Sixty-nine counties have a recorded production during this period. Eleven of these counties produced more than 100 million tons each, the highest recorded production being from Franklin County with a total of 445,261,090 tons. (A history of coal production by counties and by years was published in "Illinois Mineral Industry in 1947,"[2] table 14, pp. 26–37.)

COAL PRODUCTION IN ILLINOIS BY COUNTIES AND DISTRICTS

Forty-five Illinois counties, grouped into 14 freight rate districts, produced coal in 1950 (table 8). Thirteen of the 45 counties produced one million tons or more and account for 89.7 percent of the output of the state. Production by shipping coal mines by freight rate districts is shown in table 10. Coal values increased from 1949 to 1950. In 1949, the average value of coal at the mine was $4.04, as compared with $4.13 in 1950. The total value of output increased from $192,426,700 to $236,575,900 (table 9).

COAL PRICES

Representative coal prices for Illinois and Indiana mining districts and for districts in the Appalachian province, which are the principal suppliers of the Illinois coal market area, are given in table 12. Average prices of coal per ton at the mine in the United States are shown in figure 10.

[1] Voskuil, Walter H., Illinois Geol. Survey Rept. Inv. 94, 1944.
[2] Voskuil, Walter H., Illinois Geol. Survey Rept. Inv. 140, 1949.

TABLE 14.—COKE AND BY-PRODUCTS USED OR SOLD BY PRODUCERS IN ILLINOIS, 1949–1950[a]

	1949			1950			Percent change in quantity from 1949	Percent change in value from 1949
	Quantity	Value at plants		Quantity	Value of plants			
		Thousands of dollars	Average		Thousands of dollars	Average		
Coke produced (M tons)	3,196	$52,258	$16.35	3,590	$58,141	$16.19	+12.3	+11.2
Coal used (M tons)	4,591	44,743	9.75	5,124	51,117	9.98	+11.6	+14.2
Coal per ton of coke (tons)	1.44	—	14.00	1.43	—	14.27	—	—
Yield of coke (percent of coal used)	69.61	—	—	70.07	—	—	—	—
Plants in existence December 31	8	—	—	8	—	—	—	—
Ovens in existence December 31	900	—	—	900	—	—	—	—
Capacity (M tons)	3,905	—	—	3,852	—	—	− 1.4	—
Coke used by producer in blast furnace (M tons)	1,595	24,867	15.58	1,919	28,252	14.72	+ 20.3	+ 13.6
Coke used by producer for other purposes (M tons)	6	87	13.65	24	363	15.13	+300.0	+317.0
Coke sold for furnace use (M tons)	1,186	20,344	17.16	1,290	23,055	17.87	+ 8.8	+ 13.3
Coke sold for foundry use (M tons)	243	4,976	20.47	236	4,971	21.06	− 3.0	—
Coke sold for domestic use (M tons)	105	1,326	12.67	76	1,008	13.26	− 27.6	− 24.0
Coke sold for other use (M tons)	81	1,020	12.65	74	921	12.45	− 8.6	− 9.7
Total coke used or sold (M tons)	3,216	52,620	16.35	3,619	58,570	16.19	+ 12.3	+ 11.3
Coke inventory movement (M tons)	−20	−362	—	−29	−429	—	—	—
Total coke produced (M tons)	3,196	52,258	16.35	3,590	58,141	16.19	+ 12.3	+ 11.2
Surplus gas used or sold (Millions cu. ft.)	29,081	4,575	.157	33,441	5,606	.167	+ 15.0	+ 22.5
Tar sold (M gal.)	28,426	2,488	.087	29,894	2,631	.088	+ 5.2	+ 5.8
Ammonia sulfate equiv. sold (M lbs.)	75,634	1,572	.021	83,532	1,480	.018	+ 10.4	− 5.8
Light oil and derivatives sold (M gal.)	6,940	1,360	.196	7,229	1,761	.243	+ 4.2	+ 29.5
Total coke and by-products used or sold		$62,253			$69,619			+ 11.8

[a] Source: U. S. Bureau of Mines.

TABLE 15.—SOURCES OF COAL USED FOR PRODUCING COKE IN ILLINOIS, 1949–1950[a]

Source	Tons of coal	
	1949	1950
Arkansas	4,833	243
Illinois	274,033	437,925
Indiana	78,283	—
Kentucky	1,784,140	2,229,818
Oklahoma	1,451	—
Pennsylvania	29,652	70,565
Tennessee	1,149	24,855
Virginia	72,408	123,744
West Virginia	2,172,580	2,430,447
Total	4,418,529	5,317,597

[a] Source: U. S. Bureau of Mines.

TABLE 16.—ILLINOIS COAL SUPPLIED TO ILLINOIS AND INDIANA COKE PLANTS, 1946–1950[a]

(In tons)

Year	To Illinois plants	To Indiana plants	Total
1946	214,545	176,205	390,750
1947	226,873	225,907	452,780
1948	261,338	344,153	605,491
1949	274,033	256,661	530,694
1950	437,925	128,375	566,300

[a] Source: U. S. Bureau of Mines.

FIG. 5.—Map of Illinois, Indiana, and western Kentucky coal fields showing (in black) the extent of the main mining districts.

FIG. 6.—Illinois counties having recorded production of coal, 1882–1950.

FIG. 7.—Illinois counties having produced 100 million tons of coal, 1882–1950.

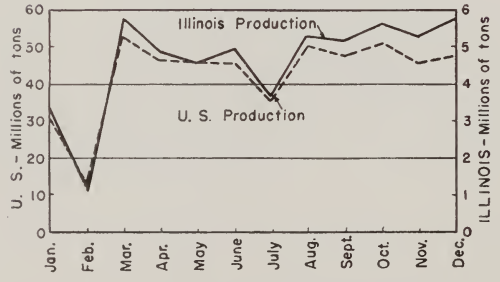

FIG. 8.—United States and Illinois monthly rate of coal production compared, 1950.

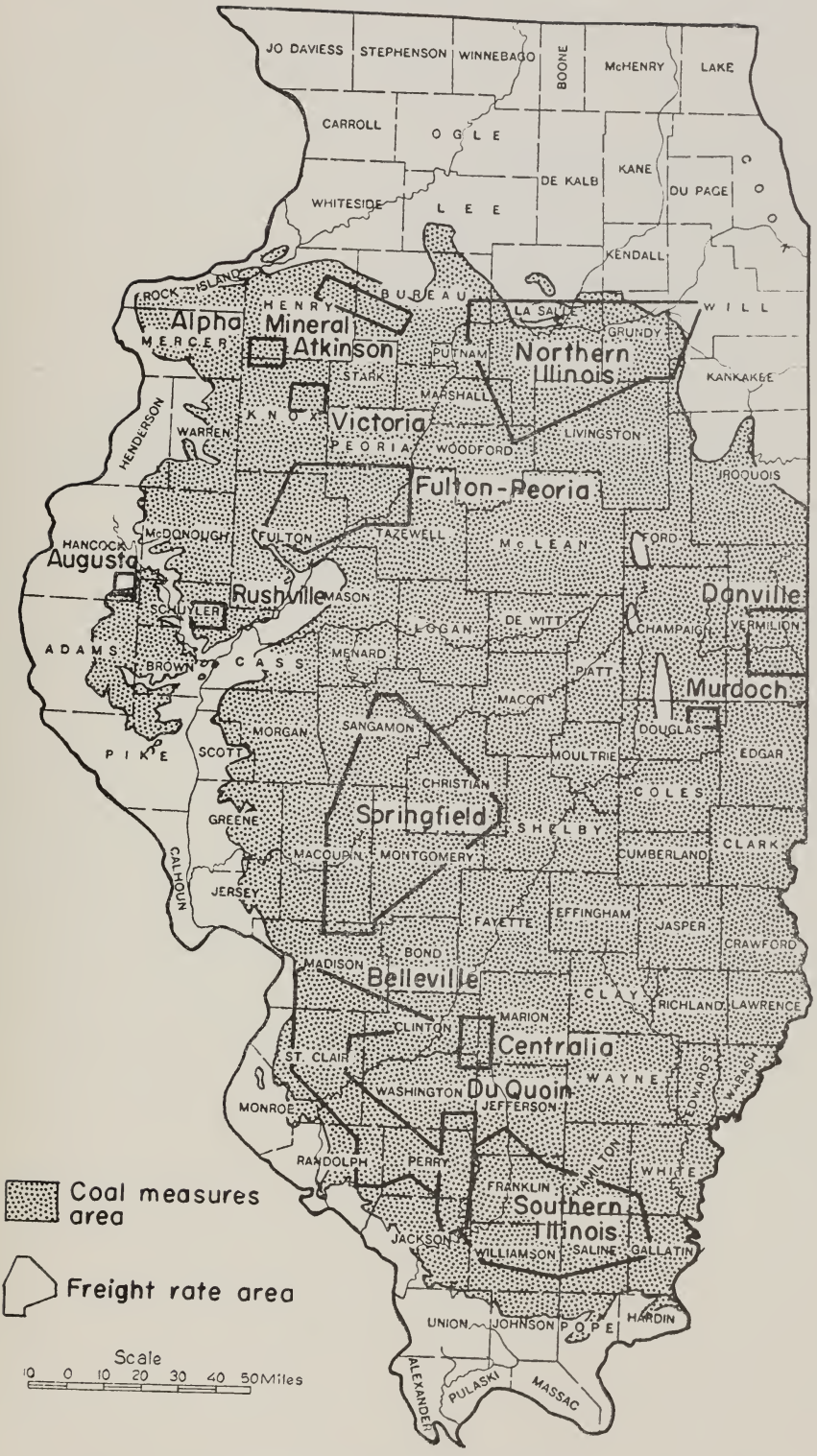

FIG. 9.—Coal freight districts of Illinois.

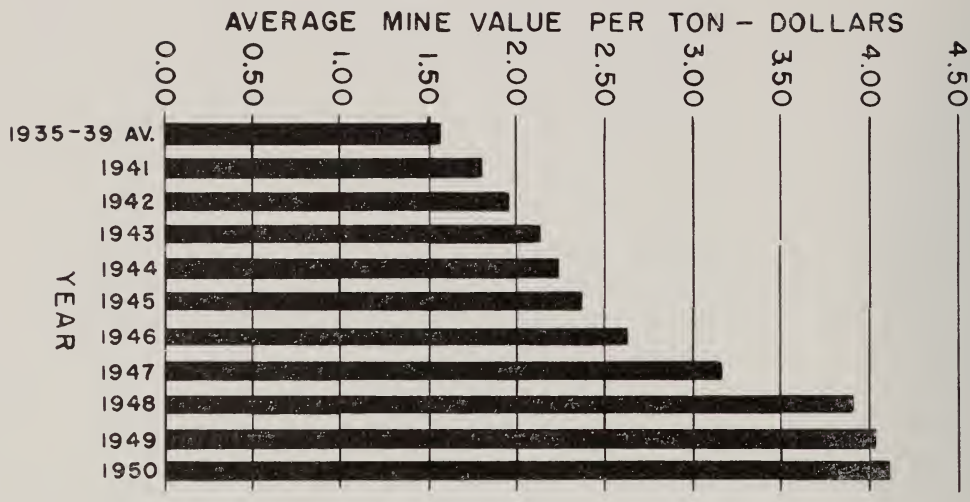

FIG. 10.—Average mine value per ton of Illinois coal, 1941–1950, compared with the 1935–1939 average value.

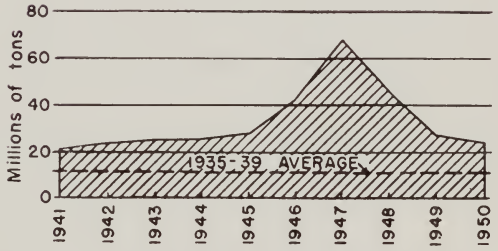

FIG. 11.—United States exports of bituminous coal, 1941–1950, compared with the 1935–1939 average exports.

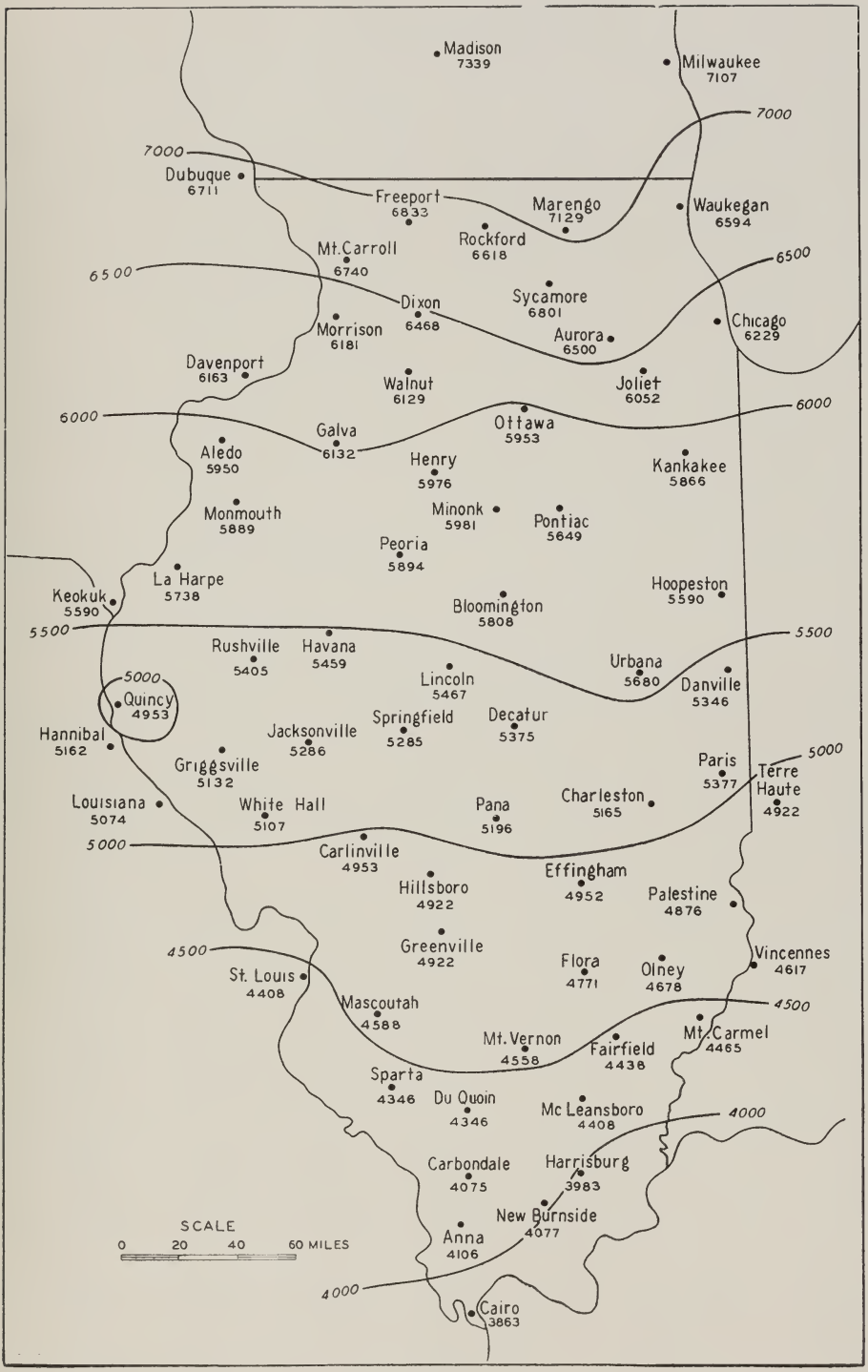

FIG. 12.—Degree-day map of Illinois and adjacent region showing cumulative average degree-days (based on data through 1941). Degree-days are the number of degrees of temperature that the average daily temperature falls below 65° F. totaled for the heating season.

PETROLEUM

National Production in 1950

In 1950, crude oil production in the United States increased to 1,971,845,000 barrels from the 1949 production of 1,841,940,000 barrels. However, the high mark of the domestic industry was set in 1948 when over 2,000,000,000 barrels was produced (table 17).

Illinois Production

Illinois production declined from 64,501,000 barrels in 1949 to 61,922,000 barrels in 1950, although the state continues to hold sixth place among the oil-producing states of the country. Table 19 shows that recent declines in Illinois production have developed in spite of the increased number of well completions.

A history of oil production and drilling activity for the period since the new fields were discovered is also given in table 19. The new fields discovered in 1950 are shown in figure 14, and Illinois production from 1905 to 1950 is shown graphically in figure 15. The sharp rise reflects the opening of the Illinois basin fields in 1936.

Reserves

Estimates of proved crude oil reserves have again increased in 1950 due to new discoveries and extensions, as well as revisions of previous estimates (table 22).

Imports

Crude oil is imported into the United States mainly from South America (fig. 16

Table 17.—Production of Crude Petroleum, by States, 1946–1950[a]
(Thousands of barrels)

State	1946	1947	1948	1949*	1950[b]
Alabama	380	396	466	462	735
Arkansas	28,375	29,948	31,682	29,986	31,108
California	314,713	333,132	340,074	332,942	327,627
Colorado	11,856	15,702	17,862	23,587	23,353
Florida	57	259	290	441	487
Illinois	75,297	66,459	64,808	64,501	61,922
Indiana	6,726	6,095	6,974	9,696	9,942
Kansas	97,218	105,132	110,908	101,868	107,586
Kentucky	10,578	9,397	8,801	8,801	10,301
Louisiana	143,669	160,128	181,458	190,826	209,116
Michigan	17,074	16,215	16,871	16,517	15,811
Mississippi	24,298	34,925	45,761	37,966	38,258
Montana	8,825	8,742	9,382	9,118	8,112
Nebraska	293	229	215	330	1,547
New Mexico	36,814	40,926	47,969	47,645	48,001
New York	4,863	4,762	4,621	4,425	4,143
Ohio	2,908	3,108	3,600	3,483	3,333
Oklahoma	134,794	141,019	154,455	151,660	164,899
Pennsylvania	12,996	12,690	12,667	11,374	11,812
Texas	760,215	820,210	903,498	744,834	829,231
Utah	—	—	16	637	1,208
West Virginia	2,929	2,617	2,692	2,839	2,788
Wyoming	38,977	44,772	55,032	47,890	60,457
Other States	84	124	83	110	68
Total	1,733,939	1,856,987	2,020,185	1,841,940	1,971,845

* Revised figures.
[a] Source: U. S. Bureau of Mines.
[b] Preliminary figures.

and table 25). Venezuela is the largest contributor, followed by Colombia. Imports of oil from Curacao and Aruba are re-exports of crude oil originating in Venezuela. Of particular interest is the recent rise in shipments from the Persian Gulf area, especially from the small principality of Kuwait.

Oil Prices

Crude oil prices for the Illinois, Indiana, Kentucky, and Ohio area, as recorded in table 24, remain unchanged from those of a year earlier.

Table 18.—States Producing 50 Million or More Barrels of Crude Petroleum in 1950[a]

State	Production (thousands of barrels)	Percent of U. S. total
Texas	829,231	42.1
California	327,627	16.6
Louisiana	209,116	10.6
Oklahoma	164,899	8.4
Kansas	107,586	5.5
Illinois	61,922	3.2
Wyoming	60,457	3.1
Total	1,760,838	89.5

[a] Source: U. S. Bureau of Mines.

Table 19.—Illinois Well Completions and Production, 1936–1950[a]

Year	Completions[b]	Producing wells	Production (thousands of barrels)		
			New fields[c]	Old fields[c, d]	Total[e]
1936	93	52	—	—	4,445
1937	449	292	2,884	4,542	7,426
1938	2,536	2,010	19,771	4,304	24,075
1939	3,617	2,970	90,908	4,004	94,912
1940	3,755	3,080	142,969	4,678	147,647
1941	3,807	2,925	128,993	5,145	134,138
1942	2,017	1,179	101,837	4,753	106,590
1943	1,791	[f]1,090 (20)	77,581	4,675	82,256
1944	1,991	1,229 (12)	72,946	4,467	77,413
1945	1,763	1,094 (15)	70,839	4,371	75,210
1946	2,362	1,387 (17)	70,174	5,123	75,297
1947	2,046	1,102 (22)	61,455	5,004	66,459
1948	2,489	1,316 (21)	59,623	5,185	64,808
1949*	2,741	1,447 (32)	58,571	5,930	64,501
1950[g]	2,894	1,328 (23)	55,688	6,234	61,922

* Revised figures.
[a] Source: Illinois State Geological Survey.
[b] Includes only oil and gas producers and dry holes.
[c] Production figures based on information furnished by oil companies and pipe line companies.
[d] Includes Devonian production at Sandoval and Bartelso.
[e] From the U. S. Bureau of Mines.
[f] Figures in parenthesis refer to number of producing wells included in total which had previously been completed as dry holes.
[g] Preliminary figures.

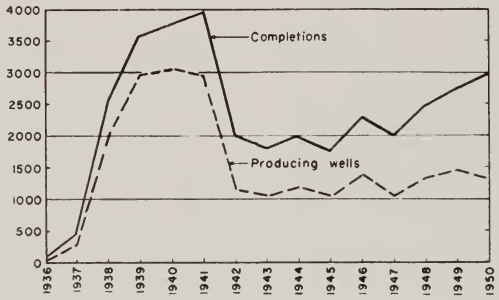

FIG. 13.—Illinois producing oil wells compared with number of well completions, 1936–1950.

TABLE 20.—PRODUCTION OF NATURAL GASOLINE IN ILLINOIS AND OTHER STATES, 1949–1950[a]
(Thousands of gallons)

State	1949	1950	Percent change from 1949
Illinois	135,147	129,701	− 4.0
Kansas	111,188	153,843	+ 38.4
Kentucky	68,054	75,183	+ 10.5
Michigan	3,628	3,283	− 9.5
Ohio	5,160	4,326	− 16.2
Oklahoma	524,398	616,823	+ 17.6
Total	847,575	983,159	+ 16.0

[a] Source: U. S. Bureau of Mines.

TABLE 21.—GASOLINE CONSUMPTION IN ILLINOIS AND THE UNITED STATES BY YEARS, 1946–1950[a]
(Thousands of gallons)

	1946	1947	1948	1949*	1950[b]
Illinois total	1,643,919	1,810,447	1,970,904	2,089,194	2,279,608
United States total	30,076,662	32,732,722	35,519,670	37,515,278	40,613,400

Percent of U. S. total consumed in Illinois in 1950 ..... 5.6

* Revised figures.
[a] Source: American Petroleum Institute.
[b] Preliminary figures.

TABLE 22.—ESTIMATES OF PROVED OIL RESERVES IN STATES SERVING THE ILLINOIS AREA, 1947–1951[a]
(Millions of barrels)

State	1947	1948	1949	1950	1951
Illinois	351	355	393	468	564
Kansas	545	563	674	738	732
Louisiana	1,652	1,791	1,869	1,910	2,185
New Mexico	543	530	552	592	592
Oklahoma	898	953	1,250	1,330	1,397
Texas	11,646	11,778	12,484	13,510	13,582
Wyoming	589	679	716	692	841

[a] Source: American Petroleum Institute. Figures as of January 1.

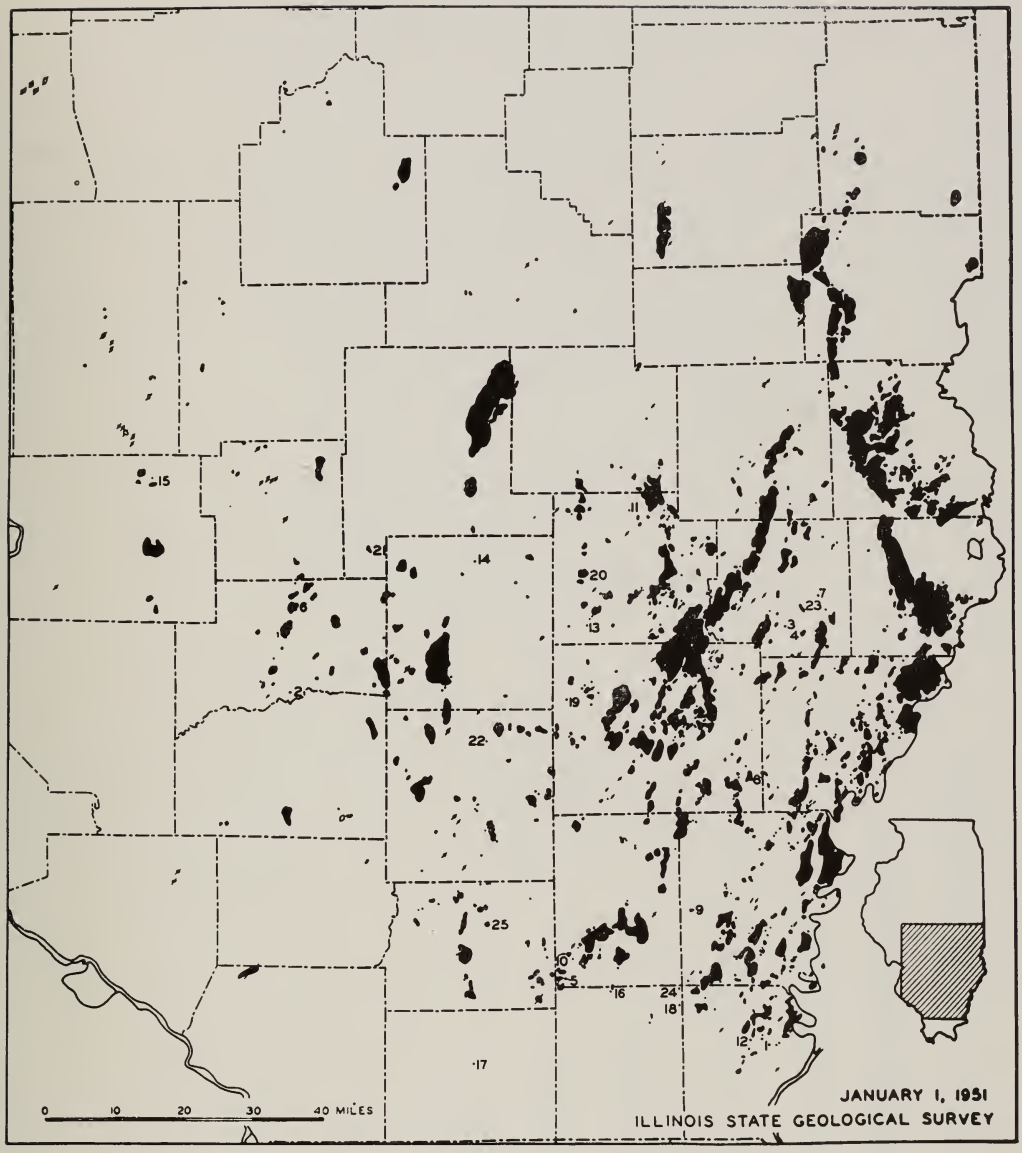

FIG. 14.—New oil pools discovered in Illinois, 1950.

1. Ab Lake West
2. Bartelso East
3. Calhoun Central
4. Calhoun East
5. Cantrell South
6. Carlyle North
7. Claremont Gas
8. Ellery West
9. Enfield
10. Flannigan
11. Hord
12. Inman South (consolidated with Inman West in 1950)
13. Kenner South
14. Kinmundy
15. Livingston South
16. Long Branch
17. Marion
18. Omaha West
19. Orchardville
20. Oskaloosa
21. Patoka West
22. Reservoir
23. Ritter
24. Roland West
25. Whittington South

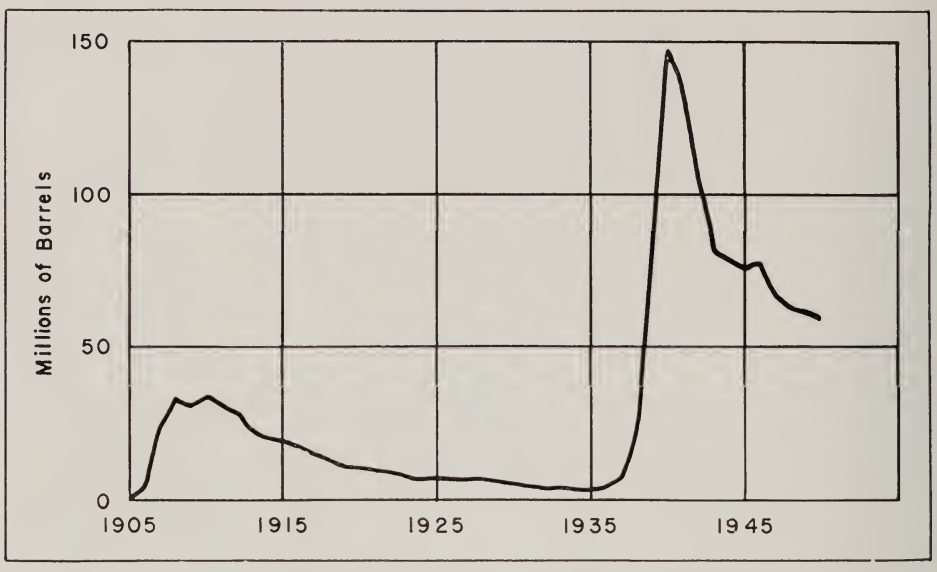

FIG. 15.—Illinois production of crude petroleum, 1905–1950.

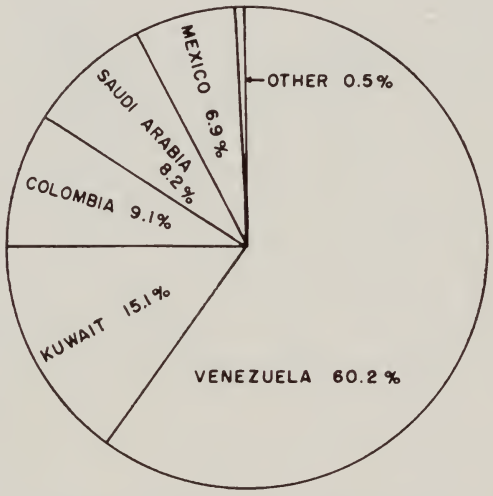

FIG. 16.—Source of United States crude petroleum imports, 1950.

TABLE 23.—ESTIMATES OF NATURAL GAS RESERVES IN STATES SERVING THE ILLINOIS AREA, 1950–1951[a]

(Millions of cubic feet)

State	1950	1951
Illinois	233,192	229,893
Kansas	14,089,560	13,790,834
Louisiana	26,687,811	28,533,266
New Mexico	6,241,003	6,990,670
Oklahoma	11,625,979	11,634,287
Texas	99,170,403	102,404,077

[a] Source: American Gas Association. Figures as of January 1.

TABLE 24.—CRUDE OIL PRICES[a]

Illinois—Indiana—Kentucky—Ohio	
Bowling Green, Ky. (Owensboro-Ashland, 7–1–49)	$2.42
Butler Co., Ky. (Owensboro-Ashland, 7–1–49)	2.55
Cleveland, O. & Others (S. O. Ohio)	3.10
Clinton Co., Ky. (Ashland O. & T.)	2.60
Corning, O. (Seep, 5–6–49)	2.70
Eastern Illinois (Ohio Oil) 1c below Schedule F	
Hitesville, Ky. & Others (Carter)	2.77
Illinois Basin (Ashland O. & R., Gulf, Magnolia, Ohio Oil, Shell, Sohio, Texaco)	2.77
Indiana Basin (Ashland O. & R., Sohio)	2.77
Lima, O. (S. O. Ohio)	2.90
Loudon, Ill. (Carter)	2.77
Mattoon, Ill. (Carter)	2.77
Plymouth, Ill. (Ohio Oil, 7–1–49)	2.44
Ragland Grade, Ky. (Ashland O. & T.)	2.43
Somerset Grade, Ky. (Ashland O. & T.)	2.83
Southern Illinois (Mohawk)	2.77
Western Kentucky (Sohio)	2.77

[a] National Petroleum News, Vol. 43, No. 5, January 31, 1951. (Prices effective as of December 6, 1947, except as herein noted.)

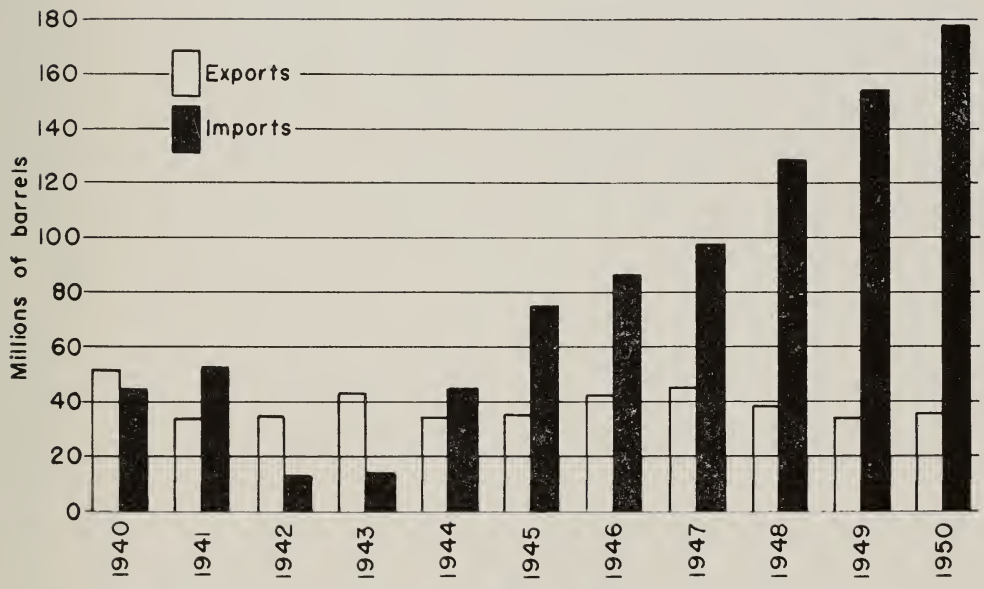

FIG. 17.—United States exports and imports of crude petroleum, 1940–1950.

TABLE 25.—IMPORTS OF FOREIGN CRUDE PETROLEUM, 1946–1950[a]
(Thousands of barrels)

From	1946	1947	1948	1949*	1950
Colombia	8,351	10,944	8,542	11,678	16,159
Curacao and Aruba	5,198	5,125	4,707	613	611
Iran	—	—	4,507	1,107	111
Iraq	—	—	766	341	—
Kuwait	115	111	3,442	23,445	26,741
Mexico	2,869	5,578	3,601	4,797	12,307
Qatar	—	—	—	—	116
Saudi Arabia	—	275	14,466	12,057	14,650
Venezuela	69,533	75,499	89,062	99,648	107,019
Total	86,066	97,532	129,093	153,686	177,714

* Revised figures.
[a] Source: U. S. Bureau of Mines.

TABLE 26.—UNITED STATES EXPORTS AND IMPORTS OF REFINED PETROLEUM PRODUCTS, 1940–1950[a]
(Thousands of barrels)

Year	Exports	Imports
1940	78,970	41,089
1941	75,592	46,536
1942	83,073	23,669
1943	108,615	49,579
1944	173,378	47,506
1945	149,985	39,282
1946	110,687	51,610
1947	118,122	61,857
1948	94,938	59,051
1949	86,307	81,873
1950	76,237	131,435

[a] Source: U. S. Bureau of Mines.

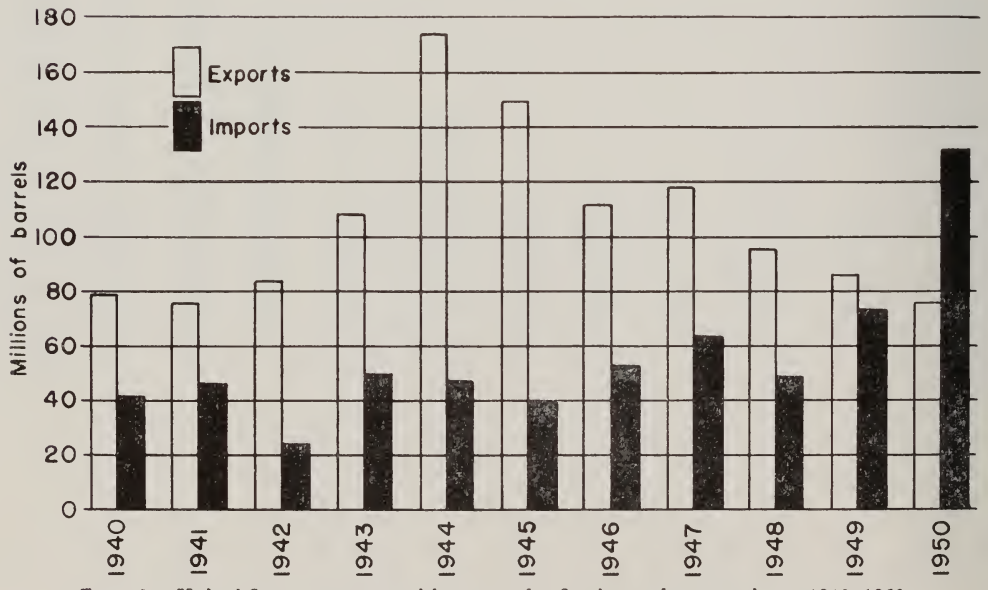

FIG. 18.—United States exports and imports of refined petroleum products, 1940–1950.

STONE AND ROCK PRODUCTS

Limestone and Dolomite

The limestone and dolomite sold or used by Illinois producers in 1950 amounted to 18,027,700 tons, valued at the plants at $21,762,600. This was an increase of 4.2 percent in amount and 2 percent in value over 1949. Details by kind and by use are given in tables 27 and 28. In general, producers reported an increased demand; in some instances, however, higher costs of labor, plant maintenance, and transportation curtailed production.

Stone for industrial uses declined 6.2 percent in amount and 8.4 percent in value from 1949, while stone for construction uses increased 10.9 percent in amount and 10.3 percent in value over 1949. Percentage changes in both amount and value of the detailed uses of stone are given in table 27. Of the total stone sold or used by producers in Illinois in 1950, industrial uses constituted 40 percent and construction uses totaled 60 percent.

A number of the smaller plants closed down during the year, some temporarily and others permanently. Several new operations were reported, and a few quarries changed ownership. Of the 186 plants reporting in 1950, 9 percent had discontinued operations and 13 percent were idle.

Commercial and Noncommercial Operations

Commercial operations are shown separately from noncommercial operations, which include the following: State of Illinois, county, township, municipal, and other government agencies. Purchases by government agencies from commercial producers are included in commercial operations.

Noncommercial operations in 1950 increased 29.1 percent in amount from the previous year, and produced 1.2 percent of the total tonnage of stone sold or used by producers in Illinois in 1950. Of this stone 98 percent was used for concrete and paving, the balance for other construction.

Agstone Used in Illinois

Reports of producers show that agstone (ground limestone and dolomite) used for soil improvement in Illinois during 1950 amounted to 4,225,200 tons, valued at the plants at $5,351,600 (table 29). This was a decrease of 16.3 percent in tonnage and 19.6 percent in value from 1949, an average decrease of five cents per ton. Illinois continued to rank first among the states in the amount of liming material used for soil treatment.

Agstone continues to be an important factor in improving soil fertility. The demand for this mineral material slackened sharply during 1950. Some producers ascribed this to higher operating costs and a drop in farm price payments. Agstone produced in Illinois and marketed in other states increased 39.5 percent in amount, and the tonnage produced in other states and used in Illinois showed a gain of 8.2 percent (table 29).

During 1950 agstone was produced in 45 of the 102 counties of the state. Of the agstone used in Illinois during the year, 96.5 percent was produced in Illinois.

Table 30 shows the use of agstone on Illinois farms during the years for which figures are available.

Cement

During 1950, sales of cement by producers in Illinois amounted to 8,145,900 barrels, valued at the plants at $17,810,400. This showed a slight decrease of 0.7 percent in amount from 1949, and an increase of 2.7 percent in value over the previous year (table 31).

While the quantity of cement sold or used by producers in Illinois in 1950 fell short, by more than 50,000 barrels, of the all-time high established in 1949, the value sets a new record.

Lime

Sales of lime by producers in Illinois in 1950 amounted to 367,500 tons, valued at

TABLE 27.—LIMESTONE AND DOLOMITE, BY USES, SOLD OR USED BY PRODUCERS IN ILLINOIS, 1949–1950[a]

Use	Type of Operation	1949*				1950					
		Plants[b]	Amount tons	Value at plants		Plants[b]	Amount tons	Value at plants		Percent change in amount from 1949	Percent change in value from 1949
				Total	Av.			Total	Av.		
Industrial											
Agstone	Commercial...	160	4,954,490	$ 6,564,568	$1.32	130	4,137,301	$ 5,285,754	$1.28	− 16.5	− 19.5
Agstone	Noncom.	1	1,190	1,190	1.00	2	3,811	3,811	1.00	+220.3	+220.3
Metallurgical and flux[c]	Commercial...	8	1,047,887	1,313,679	1.25	10	1,194,795	1,498,765	1.25	+ 14.0	+ 14.0
Chemical uses[d]	Commercial...	—	422,935	332,558	.79	—	607,708	425,467	.70	+ 43.7	+ 27.9
Limestone whiting[e]	Commercial...	2	15,413	80,670	5.23	3	15,235	73,861	4.85	− 1.2	− 8.5
Asphalt filler	Commercial...	5	188,908	742,146	3.93	6	226,090	820,191	3.63	+ 19.7	+ 10.5
Miscellaneous filler[f]	Commercial...	3	3,513	16,270	4.63	2	557	4,994	8.97	− 84.2	− 69.3
Other industrial uses[g]	Commercial...	9	117,383	405,658	3.46	6	148,536	551,822	3.72	+ 26.5	+ 36.0
Total industrial uses	Both	162	6,751,719	9,456,739	1.40	132	6,334,033	8,664,665	1.37	− 6.2	− 8.4
Construction											
Concrete and paving	Commercial...	120	8,853,077	10,076,752	1.14	84	9,399,648	10,683,039	1.14	+ 6.2	+ 6.0
Concrete and paving	Noncom.	6	162,855	116,678	.72	8	207,970	161,262	.78	+ 27.7	+ 38.2
Railroad ballast	Commercial...	15	674,492	642,814	.95	15	1,084,144	1,040,763	.91	+ 60.7	+ 61.9
Riprap	Commercial...	21	253,083	304,452	1.20	21	297,414	336,948	1.13	+ 17.5	+ 10.7
Riprap	Noncom.	—	—	—	—	1	36	36	1.00	—	—
Rough construction	Commercial...	—	(h)	(h)	—	—	(h)	(h)	—	—	—
Rubble	Commercial...	6	35,872	57,556	1.60	6	4,513	4,132	.92	− 87.4	− 92.8
Flagging	Commercial...	5	2,159	12,523	5.80	7	2,866	15,216	5.03	+ 32.7	+ 21.5
Other construction uses[i]	Commercial...	14	566,873	661,185	1.17	17	697,068	856,594	1.23	+ 23.0	+ 29.6
Total construction uses.	Both	133	10,548,411	11,871,960	1.13	103	11,693,659	13,097,990	1.12	+ 10.9	+ 10.3
Total operations	Commercial...	175	17,136,085	21,210,831	1.23	135	17,815,875	21,597,546	1.21	+ 4.0	+ 1.8
Total operations	Noncom.	6	164,045	117,868	.72	8	211,817	165,109	.78	+ 29.1	+ 40.1
Total stone	Both	181	17,300,130	$21,328,699	$1.23	143	18,027,692	$21,762,655	$1.21	+ 4.2	+ 2.0

* Revised figures.
[a] Summary of joint canvass made by Illinois Geological Survey and U. S. Bureau of Mines.
[b] Number of plants reporting production.
[c] Includes refractory dolomite, flux for blast furnaces and open-hearth plants, and stone for aluminum refining and other metallurgical uses.
[d] Includes stone for alkali works and other chemical uses.
[e] Includes limestone whiting for cartridge filler, caulking compounds, dye, grease, kalsomine, picture-frame moulding, pottery, tanning, tooth paste, and for paint, putty, rubber, and other fillers; excludes asphalt filler.
[f] Includes pulverized stone for fertilizer, and other fillers.
[g] Includes stone for lime manufacturing, mineral food, and regrinding, and dust for coal mines.
[h] Included in rubble.
[i] Includes chips for driveways, building stone, stone sand, and stone for filter beds and for unspecified uses.

TABLE 28.—LIMESTONE AND DOLOMITE, BY KINDS AND BY USES, SOLD OR USED BY PRODUCERS IN ILLINOIS, 1950[a]

Use	Type of operation	Limestone				Dolomite			
		Plants[b]	Amount tons	Value at plants		Plants[b]	Amount tons	Value at plants	
				Total	Av.			Total	Av.
Industrial									
Agstone	Commercial	69	2,567,949	$3,457,758	$1.35	61	1,569,352	$1,827,996	$1.16
Agstone	Noncom.	2	3,811	3,811	1.00	—	—	—	—
Metallurgical and flux	Commercial	4	[c] 282,651	[c] 402,788	1.43	6	[d] 912,144	[d] 1,095,977	1.20
Chemical uses	Commercial	—	607,708	425,467	.70	—	—	—	—
Limestone whiting	Commercial	3	[e] 15,235	[e] 73,861	4.85	—	—	—	—
Miscellaneous filler	Commercial	2	[f] 28,784	[f] 55,963	1.94	4	[f] 197,863	[f] 769,222	3.89
Other industrial uses	Commercial	4	[g] 111,680	[g] 511,906	4.58	2	[h] 36,856	[h] 39,916	1.08
Total industrial uses	Both	70	3,617,818	4,931,554	1.36	62	2,716,215	3,733,111	1.37
Construction									
Concrete and paving	Commercial	47	3,334,303	3,833,823	1.15	37	6,065,345	6,849,216	1.13
Concrete and paving	Noncom.	4	15,393	16,785	1.09	4	192,577	144,477	.75
Railroad ballast	Commercial	4	78,475	94,094	1.20	11	1,005,669	946,669	.94
Riprap	Commercial	17	281,248	313,688	1.12	4	16,166	23,260	1.44
Riprap	Noncom.	1	36	36	1.00	—	—	—	—
Rough construction	Commercial	—	[i]	[i]	—	—	—	—	—
Rubble	Commercial	3	253	1,083	4.28	3	4,260	3,049	.72
Flagging	Commercial	4	657	1,757	2.67	3	2,209	13,459	6.09
Other construction uses	Commercial	11	[j] 607,091	[j] 762,240	1.26	6	[k] 89,977	[k] 94,354	1.05
Total construction uses	Both	59	4,317,456	5,023,506	1.16	44	7,376,203	8,074,484	1.09
Total operations	Commercial	72	7,916,034	9,934,428	1.25	63	9,899,841	11,663,118	1.18
Total operations	Noncom.	4	19,240	20,632	1.07	4	192,577	144,477	.75
Total stone	Both	76	7,935,274	$9,955,060	$1.25	67	10,092,418	$11,807,595	$1.17

[a] Summary of joint canvass made by Illinois Geological Survey and U. S. Bureau of Mines.
[b] Number of plants reporting production.
[c] Includes flux for open-hearth plants and blast furnaces, and stone for other metallurgical uses.
[d] Includes refractory dolomite for open-hearth plants, and flux for blast furnaces.
[e] Includes limestone whiting for grease, dyes, kalsomine, picture-frame moulding, pottery, tanning, and for paint, putty, rubber, and other fillers; excludes asphalt filler.
[f] Includes pulverized stone for asphalt, fertilizer, and other fillers.
[g] Includes stone for lime manufacturing, mineral food, and dust for coal mines.
[h] Includes stone for mineral food, regrinding, and dust for coal mines.
[i] Included in rubble.
[j] Includes chips for driveways, building stone, and stone for filter beds, and for unspecified uses.
[k] Includes chips for driveways, stone sand, and stone for filter beds and for unspecified uses.

TABLE 29.—AGSTONE USED IN ILLINOIS, 1949–1950[a]

Agstone	1949*				1950				
	Plants[b]	Amount tons	Value at plants		Plants[b]	Amount tons	Value at plants		Percent change in amount from 1949
			Total	Av.			Total	Av.	
Produced in Illinois									
Limestone	86	3,057,719	$4,330,039	$1.42	71	2,571,760	$3,461,569	$1.35	−15.9
Dolomite	75	1,897,961	2,235,719	1.18	61	1,569,352	1,827,996	1.16	−17.3
Total produced in Illinois	161	4,955,680	6,565,758	1.32	132	4,141,112	5,289,565	1.28	−16.4
Less marketed in other states	8	45,541	59,425	1.30	11	63,507	81,448	1.28	+39.5
Produced and used in Illinois	161	4,910,139	6,506,333	1.32	132	4,077,605	5,208,117	1.28	−17.0
Produced in other states and used in Illinois	10	136,378	145,115	1.06	11	147,562	143,468	.97	+ 8.2
Total agstone used in Illinois	171	5,046,517	$6,651,448	$1.32	143	4,225,167	$5,351,585	$1.27	−16.3

* Revised figures.
[a] Summary of canvass made by Illinois Geological Survey in cooperation with Illinois Agricultural Association and Midwest Limestone Institute.
[b] Number of plants reporting production.

Table 30.—Agstone Used in Illinois Annually, 1927–1950[a]

Year	Tons	Value	Av. price per ton
1927	647,155	$ 579,639	$0.90
1928	565,001	511,005	.91
1929	947,798	843,693	.89
1930	868,426	740,785	.86
1931	268,874	241,376	.90
1932	164,933	140,969	.86
1933	227,466	165,667	.73
1934	491,644	319,604	.65
1935	379,555	268,139	.71
1936	1,114,466	871,862	.78
1937	1,310,513	1,279,981	.97
1938	1,251,263	1,247,150	1.00
1939	1,497,458	1,318,173	.88
1940	2,365,663	1,999,580	.84
1941	3,084,855	2,873,536	.93
1942	3,866,568	3,600,313	.93
1943	3,236,477	3,175,108	.98
1944	4,214,600	4,388,886	1.04
1945	4,287,568	4,627,705	1.08
1946	5,595,699	6,262,247	1.12
1947	5,380,411	6,683,210	1.24
1948	5,427,087	7,234,190	1.33
1949	*5,046,517	*6,651,448	*1.32
1950	4,225,167	5,351,585	1.27

* Revised figures.
[a] U. S. Bureau of Mines, 1927-29; canvass by Illinois Agricultural Association 1930; canvass by Illinois Geological Survey, 1931-1950.

the plants at $4,465,400 as shown in table 32. Of this tonnage, 90 percent was quicklime and sintered dolomite, and 10 percent was hydrated lime.

Total lime increased 33.1 percent in quantity and 39.6 percent in value, an average increase of 57 cents per ton. Sintered dolomite and metallurgical lime amounted to 70 percent of the total lime sold or used, and lime for chemical and industrial uses totaled 28 percent. Under this latter classification is included lime for water purification and softening, sewage and trade-wastes treatment, insecticides, fungicides, disinfectants, petroleum refining, glue, lubricating grease, paper manufacturing, tanning, and for other purposes.

Ganister and Sandstone

Ganister is a siliceous material found in Alexander and Union counties in southern Illinois. It is used for refractory purposes.

Sandstone and miscellaneous stone are produced in various parts of the state for road work and for foundations, riprap, and rubble, mostly in noncommercial operations.

Total sales and uses of ganister, sandstone, and miscellaneous stone by producers in Illinois are given in table 33.

Clays and Clay Products

Clays and clay products (including silica refractories) sold and shipped by producers in Illinois in 1950 were valued at the plants at $49,133,300, an increase of 29 percent over the previous year. This figure exceeds by 9.9 percent the all-time record of 1948, when sales and shipments totaled $44,700,000. Clays and clay products again hold the position of third largest mineral industry in Illinois, ranking next to coal and petroleum.

All groups in the clays and clay products classification contributed to this outstanding record, as shown by the following percentage increases in value over 1949 (tables 34 and 35):

	Percent
Clays	18.4
Refractories	21.1
Structural clay products	24.1
Whiteware and pottery	39.2

The two chief factors in establishing this all-time high were the increased demand of the construction industry for these types of material, and the almost 100-percent cooperation of the producers in submitting their figures; only two producers failed to report on 1950 operations. Of the plants reporting, 86 percent were operating, 9 percent were idle, and 2 percent had discontinued operations.

Clays

In 1950 clays sold and shipped as such amounted to 238,000 tons, valued at the mines or pits at $1,178,000, an increase of 13.2 percent in quantity and 18.4 percent in value over the previous year, as shown in table 34. Clays used by producers in the manufacture of clay products at their own

TABLE 31.—CEMENT SOLD OR USED BY PRODUCERS IN ILLINOIS, 1949–1950[a]

Kind	1949				1950				Percent change in amount from 1949
	Plants[b]	Amount bbls.[c]	Value at plants		Plants[b]	Amount bbls.[c]	Value at plants		
			Total	Av.			Total	Av.	
Standard portland cement									
General use and moderate heat	4	6,797,130	$14,086,230	$2.07	4	6,840,124	$14,652,695	$2.14	+ 0.6
Special portland cements									
High-early-strength	4	277,360	700,985	2.53	4	229,049	599,275	2.61	−17.4
Other special portlands	3	902,482	1,858,515	2.06	3	787,064	1,668,264	2.12	−12.8
Total portland cement	4	7,976,972	16,645,730	2.09	4	7,856,237	16,920,234	2.15	− 1.5
Less cement used in manufacture of masonry or mortar cements	4	229,868	480,424	2.09	4	232,141	499,103	2.15	+ 1.0
Total	4	7,747,104	16,165,306	2.09	4	7,624,096	16,421,131	2.15	− 1.6
Masonry or mortar cements	4	453,044	1,175,476	2.59	4	521,789	1,389,286	2.66	+15.2
Total cement	4	8,200,148	$17,340,782	$2.11	4	8,145,885	$17,810,417	$2.19	− 0.7

[a] Compiled from canvass made by U. S. Bureau of Mines.
[b] Number of plants reporting production.
[c] Weight per barrel 376 pounds.
[d] Includes air-entrained and waterproof portland cements.

TABLE 32.—LIME SOLD OR USED BY PRODUCERS IN ILLINOIS, 1949–1950[a]

Kind and Use	1949				1950				Percent change in amount from 1949
	Plants[b]	Amount tons	Value at plants		Plants[b]	Amount tons	Value at plants		
			Total	Av.			Total	Av.	
Quicklime and sintered dolomite									
Building lime	4	7,623	$ 85,829	$11.26	3	6,908	$ 74,675	$10.81	− 9.4
Sintered dolomite and metallurgical lime	5	171,482	2,052,433	11.97	6	256,144	3,174,044	12.39	+49.4
Other chemical and industrial uses	4	62,327	660,889	10.60	4	68,680	786,265	11.45	+10.2
Total	6	241,432	2,799,151	11.59	6	331,732	4,034,984	12.16	+37.4
Hydrated lime									
Building lime	3	2,304	27,131	11.78	3	3,330	41,690	12.52	+44.5
Chemical and industrial uses	3	32,425	371,608	11.46	3	32,423	388,739	11.99	0.0
Total	3	34,729	398,739	11.48	3	35,753	430,429	12.04	+ 2.9
Total lime	6	276,161	$3,197,890	$11.58	6	367,485	$4,465,413	$12.15	+33.1

[a] Summary of joint canvass made by Illinois Geological Survey and U. S. Bureau of Mines.
[b] Number of plants reporting production.

Table 33.—Ganister and Sandstone Sold or Used by Producers in Illinois, 1946–1950[a]

Year	Amount tons[b]	Value at plants	
		Total	Av.
1946.....	8,336	$10,900	$ 1.30
1947.....	16,299	18,757	1.15
1948.....	200	1,000	5.00
1949.....	830	9,378	11.30
1950.....	4,081	11,781	2.89

[a] Summary of joint canvass made by Illinois Geological Survey and U. S. Bureau of Mines.
[b] Includes ganister for refractory purposes, and sandstone for road work and for foundations, riprap, and rubble.

plants are not included, but are reported in the resultant clay products in table 35.

Fire clay totaled 223,400 tons, valued at the plants at $1,145,200, and amounted to 93.8 percent of all clays shipped. Shale and surface clay are grouped under one heading because fewer than three producers reported sales of each of these types of clay and separate figures could not be shown without revealing individual operations. For the same reason kaolin and stoneware clay are combined under "other clays." No production of fuller's earth was reported for 1950.

Clays for ceramic uses totaled 91.4 percent of the total clays sold and shipped in 1950, and that for nonceramic uses amounted to 8.6 percent. Nonceramic uses include clay for fillers, bonding foundry sands, and modeling clay. Table 34 shows in detail the percentage changes in amount and value from 1949, by kind and by use.

Clay Products, Including Silica Refractories

Clay products, including silica refractories, sold and shipped by producers in Illinois in 1950 were valued at the plants at $47,955,300, an increase of 29.3 percent over 1949, and 10.5 percent more than the all-time high record established in 1948. In this group are included the following classifications: refractories (clay and silica), structural clay products, and whiteware and pottery. In 1950 refractories represented 19 percent of the total value of clay products sold and shipped, structural clay products comprised 39 percent, and whiteware and pottery amounted to 42 percent of the total value.

Refractories. — Refractories, clay and silica, totaled 253,100 tons, valued at the plants at $9,227,600, an increase of 18.1 percent in amount and 21.1 percent in value over the previous year. Firebrick and shapes comprised 84.8 percent of the total value of refractories sold and shipped. Under "other refractories" are included flue liners, grog, and zinc retorts and condensers.

Structural clay products. — Structural clay products amounted to 1,782,200 tons, valued at the plants at $18,707,800, an increase of 20.3 percent in quantity and 24.1 percent in value over 1949. All types of structural clay products, except paving block and drain tile, showed substantial increases in both amount and value over the previous year. "Other structural products" include facing block, haydite, and ground shale building block.

Whiteware and pottery. — Whiteware and pottery sold and shipped by producers in Illinois in 1950 were valued at $20,019,900, an increase of 39.2 percent over 1949, the largest percentage increase of the three classifications in the clay products group. Whiteware and pottery also comprised the highest percentage of the total value of clay products sold and shipped in 1950. Under "porcelain and other whiteware" are included chemical stoneware and porcelain, electrical porcelain, and unspecified products.

Table 35 shows in detail the percentage changes in amount and value from 1949 for the various types of clay products.

TABLE 34.—CLAYS (INCLUDING FULLER'S EARTH) SOLD AND SHIPPED BY PRODUCERS IN ILLINOIS, BY KINDS AND BY USES, 1949–1950[a]

Kind and Use	1949				1950					
	Plants[b]	Amount tons	Value at plants		Plants[b]	Amount tons	Value at plants		Percent change in amount from 1949	Percent change in value from 1949
			Total	Av.			Total	Av.		
Kind										
Fire clay	6	179,296	$834,010	$4.65	9	223,352	$1,145,213	$5.13	+ 24.6	+ 37.3
Shale and surface clay	4	16,224	24,464	1.51	3	9,431	15,675	1.66	− 41.9	− 35.9
Other clays	5	[c]14,774	[c]136,277	9.22	4	[d]5,174	[d]17,129	3.31	− 65.0	− 87.4
Total clays sold and shipped	13	210,294	994,751	4.73	14	237,957	1,178,017	4.95	+ 13.2	+ 18.4
Use										
Ceramic										
Refractories[e]	6	138,430	551,946	3.99	5	177,588	827,592	4.66	+ 28.3	+ 49.9
Structural products	3	20,075	34,594	1.72	4	18,874	35,873	1.90	− 6.0	+ 3.7
Whiteware and pottery	4	18,277	54,743	3.00	5	20,947	64,094	3.06	+ 14.6	+ 17.1
Total ceramic uses	11	176,782	641,283	3.63	12	217,409	927,559	4.27	+ 23.0	+ 44.6
Nonceramic										
Miscellaneous uses[f]	4	33,512	353,468	10.55	5	20,548	250,458	12.18	− 38.7	− 29.1
Total clays sold and shipped	13	210,294	$994,751	$4.73	14	237,957	$1,178,017	$4.95	+ 13.2	+ 18.4

[a] Summary of joint canvass made by Illinois Geological Survey and U. S. Bureau of Mines.
[b] Number of plants reporting production.
[c] Includes kaolin, stoneware clay, and fuller's earth.
[d] Includes kaolin and stoneware clay; no production of fuller's earth reported for 1950.
[e] Includes clay for laying and daubing, foundries, fire-clay mortar, and clay crucibles.
[f] Includes clay for fillers, bonding foundry sands, and for other uses.

TABLE 35.—CLAY PRODUCTS (INCLUDING SILICA REFRACTORIES) SOLD AND SHIPPED BY PRODUCERS IN ILLINOIS, 1949–1950[a]

Kind and Use	1949				1950					
	Plants[b]	Amount	Value at plants		Plants[b]	Amount	Value at plants		Percent change in amount from 1949	Percent change in value from 1949
			Total	Av.			Total	Av.		
Refractories, clay and silica		*tons*				*tons*				
Firebrick and shapes	8	191,178	$ 6,503,529	$34.02	7	223,234	$ 7,830,754	$35.08	+ 16.8	+ 20.4
Plastic and castable refractories	4	11,335	657,862	58.04	4	11,973	624,986	52.20	+ 5.6	+ 9.5
Cements and mortars	7	7,979	402,657	50.46	7	10,662	577,967	54.21	+ 33.6	+ 43.5
Other refractories	4	3,785	57,999	15.32	4	7,184	193,941	27.00	+ 89.8	+234.4
Total refractories	12	214,277	7,622,047	35.57	12	253,053	9,227,648	36.46	+ 18.1	+ 21.1
Structural clay products		*thous.*				*thous.*				
Common brick	24	341,809	6,199,189	18.14	27	446,279	8,738,777	19.58	+ 30.6	+ 41.0
Face brick	16	145,062	4,428,595	30.53	16	146,634	4,968,010	33.88	+ 1.1	+ 12.2
Paving block	1	28	1,330	47.53	1	18	1,157	64.28	− 35.7	− 13.0
		tons				*tons*				
Total (in equivalent tons)	28	1,217,276	10,629,114	8.73	29	1,482,345	13,707,944	9.25	+ 21.8	+ 29.0
Drain tile	20	135,415	1,644,075	12.14	17	120,715	1,353,360	11.21	− 10.9	− 18.0
Structural tile	14	62,179	639,849	10.29	14	72,140	933,940	12.95	+ 16.0	+ 46.0
Sewer pipe, flue lining, wall coping	5	29,922	917,384	30.66	4	37,827	1,166,359	30.91	+ 26.4	+ 27.1
Terra cotta and glazed block[c]	—	—	—	—	—	—	—	—	—	—
Other structural products	4	37,058	1,247,418	33.66	6	69,143	1,546,152	22.36	+ 86.6	+ 23.9
Total structural products	42	1,481,850	15,077,840	10.18	42	1,782,170	18,707,755	10.50	+ 20.3	+ 24.1
Whiteware and pottery										
Earthenware (flower pots)	3	—	363,775	—	—	—	(d)	—	—	—
Stoneware	3	—	1,023,905	—	5	—	1,322,427	—	—	− 4.7
Garden pottery	—	—	(e)	—	—	—	—	—	—	—
Dinnerware and art china	3	—	2,490,851	—	4	—	3,342,553	—	—	+ 34.2
Art pottery	4	—	3,210,893	—	4	—	3,830,585	—	—	+ 19.3
Vitreous-china plumbing fixtures	2	—	5,632,158	—	3	—	9,490,604	—	—	+ 68.5
Porcelain and other whitewares	4	—	1,659,791	—	3	—	2,033,739	—	—	+ 22.5
Total whiteware and pottery	16	—	14,381,373	—	15	—	20,019,908	—	—	+ 39.2
Total clay products	68	—	37,081,260	—	67	—	47,955,311	—	—	+ 29.3
Total clays and clay products (Tables 34 and 35)	76	—	$38,076,011	—	75	—	$49,133,328	—	—	+ 29.0

[a] Summary of canvass made by Illinois Geological Survey.
[b] Number of plants reporting production.
[c] Included in "Other structural products."
[d] Included in "Stoneware."
[e] Included in "Dinnerware and art china."

SAND AND GRAVEL

Silica Sand

The amount of silica sand sold or used by producers in Illinois in 1950 totaled 2,322,700 tons, valued at the plants at $4,958,300, as shown in table 37. This was an increase of 16.7 percent in amount and 19.8 percent in value, an average increase of five cents per ton. Illinois ranks first among the states in the production of this mineral material.

Silica sand is used almost entirely for industrial purposes, and less than 1 percent of that sold or used by producers in Illinois was for construction work. Glass sand comprised 44.5 percent of the total tonnage and 42.7 percent of the total value of silica sand sold or used in 1950. Steel molding sand reflected the highest percentage increases from 1949—26.1 percent in amount and 32.5 percent in value. "Other silica sand" includes sand for unspecified uses and that undistributed by the producer.

Other Sand and Gravel

Sand (other than silica sand) and gravel sold or used by producers in Illinois in 1950 amounted to 15,358,800 tons and was valued at the plants at $10,986,100. This was an increase of 0.5 percent in amount and 4.4 percent in value. The average value of 72 cents per ton exceeded last year's average of 69 cents, which was the highest recorded since 1920.

As in the past, producer reports on the sand and gravel business varied greatly according to local conditions. Some stated that the demand was good, prices were higher, wages up, and that there were no strikes or labor troubles. Others reported that the demand for sand and gravel had fallen off due to the lack of sufficient funds by government agencies for highway maintenance and the promotion of new road-building projects. Credit regulations and a shortage of cement, increased production and transportation costs were also reported as factors in slowing down production.

Of the total tonnage of sand (other than silica sand) and gravel reported in 1950, 3.9 percent was from government-and-contractor operations, which includes sand and gravel produced either by the state of Illinois, counties, townships, and municipalities, or by contractors expressly for their use. Purchases by government agencies from commercial producers are included in commercial operations.

"Other sand" amounted to 6,693,400 tons, and was valued at the plants at $5,097,200, a decrease of 1.1 percent in amount and an increase of 1.9 percent in value from 1949. Construction sands comprised 95.7 percent in amount and 92.3 percent in value of the total sand (other than silica sand) sold and used in 1950 (table 36).

Gravel amounted to 56.4 percent of the total tonnage and 53.6 percent of the total value of sand (other than silica sand) and gravel sold or used by producers in Illinois in 1950. It totaled 8,665,400 tons and was valued at the pits at $5,888,900, showing an increase of 1.8 percent in amount and 6.8 percent in value over 1949 (table 36).

Total sand (including silica sand) and gravel amounted to 17,681,400 tons, valued at the plants at $15,944,400, an increase of 2.4 percent in quantity and 8.7 percent in value over 1949. Of these totals, industrial sands comprised 14.7 percent of the tonnage and 33.3 percent of the value; construction sands totaled 85.3 percent of the tonnage and 66.7 percent of the value. Percentage changes in amount from 1949, by kind and by use, are given in table 36.

Of the 185 plants reporting on 1950 operations, 10.5 percent had discontinued business during the year, 1 percent had changed ownership, 10.5 percent were idle, and 78 percent reported production. Eight new operations were listed during the year.

TABLE 36.—SAND (OTHER THAN SILICA SAND) AND GRAVEL SOLD OR USED BY PRODUCERS IN ILLINOIS, 1949–1950[a]

Kind and Use	Type of operation	1949*				1950				Percent change in amount from 1949
		Plants[b]	Amount tons	Value at plants		Plants[b]	Amount tons	Value at plants		
				Total	Av.			Total	Av.	
Sand (other than silica sand)										
Industrial sands										
Natural-bonded molding sand	Commercial	6	88,925	$ 167,377	$1.88	5	115,411	$ 225,540	$1.95	+29.8
Engine sand	Commercial	9	77,294	60,546	.78	11	79,532	61,516	.77	+ 2.9
Other industrial sand	Commercial	—	—	—	—	3	92,792	104,123	1.12	—
Total	Commercial	14	166,219	227,923	1.37	17	287,735	391,179	1.36	+73.1
Construction sands										
Building sand[c]	Commercial	63	3,870,513	2,747,074	.71	66	4,104,326	2,980,874	.73	+ 6.0
Building sand[c]	Gov.-contr.	—	—	—	—	—	—	—	—	—
Paving and highway-structures sand	Commercial	41	2,114,010	1,608,552	.76	39	1,933,143	1,464,550	.76	− 8.6
Paving and highway-structures sand	Gov.-contr.	5	41,387	26,297	.64	2	48,980	36,610	.75	+18.3
Railroad ballast sand	Commercial	6	170,168	96,868	.57	6	137,179	78,485	.57	−19.4
Other construction sands	Commercial	19	405,109	300,649	.74	11	182,007	145,468	.80	−55.1
Total	Both	91	6,601,187	4,779,440	.72	82	6,405,635	4,705,987	.73	− 3.0
Total sand (other than silica sand)	Commercial	90	6,726,019	4,981,066	.74	86	6,644,390	5,060,556	.76	− 1.2
Total sand (other than silica sand)	Gov.-contr.	5	41,387	26,297	.64	2	48,980	36,610	.75	+18.3
Total sand (other than silica sand)	Both	95	6,767,406	5,007,363	.74	88	6,693,370	5,097,166	.76	− 1.1
Gravel										
Building gravel[c]	Commercial	69	3,577,430	2,559,647	.72	75	3,838,699	2,909,622	.76	+ 7.3
Building gravel[c]	Gov.-contr.	5	65,892	35,806	.54	4	56,574	24,432	.43	−14.1
Paving and highway-structures gravel	Commercial	106	3,348,366	2,069,676	.62	77	3,549,554	2,290,022	.65	+ 6.0
Paving and highway-structures gravel	Gov.-contr.	25	697,333	424,037	.61	27	497,490	274,516	.55	−28.7
Railroad-ballast gravel	Commercial	12	634,583	314,264	.50	14	601,603	310,705	.52	− 5.2
Other gravel	Commercial	16	187,314	112,768	.60	16	121,501	79,609	.66	−35.1
Total	Both	171	8,510,918	5,516,198	.65	150	8,665,421	5,888,906	.68	+ 1.8

Total gravel	Commercial	141	7,747,693	5,056,355	.65	119	8,111,357	5,589,958	.69	+ 4.7
Total gravel	Gov.-contr.	30	763,225	459,843	.60	31	554,064	298,948	.54	−27.4
Total gravel	Both	171	8,510,918	5,516,198	.65	150	8,665,421	5,888,906	.68	+ 1.8
Total sand (other than silica sand) and gravel	Commercial	155	14,473,712	10,037,421	.69	134	14,755,747	10,650,514	.72	+ 1.9
Total sand (other than silica sand) and gravel	Gov.-contr.	31	804,612	486,140	.60	31	603,044	335,558	.56	−25.1
Total sand (other than silica sand) and gravel	Both	186	15,278,324	10,523,561	.69	165	15,358,791	10,986,072	.72	+ 0.5

Summary—Sand (Including Silica Sand) and Gravel
Tables 36 *and* 37

Total industrial sands (including silica sand)	Both	27	2,156,341	4,366,259	2.02	28	2,595,047	5,315,957	2.05	+20.3
Total construction sands and gravel	Both	182	15,112,105	10,295,638	.68	160	15,086,401	10,628,415	.70	− 0.2
Total sand (including silica sand) and gravel	Both	200	17,268,446	$14,661,897	$0.85	176	17,681,448	$15,944,372	$0.91	+ 2.4

* Revised figures.
[a] Summary of joint canvass made by Illinois Geological Survey and U. S. Bureau of Mines.
[b] Number of plants reporting production.
[c] Excludes highway structures.

TABLE 37.—SILICA SAND SOLD OR USED BY PRODUCERS IN ILLINOIS, 1949–1950[a]

Use	Type of operation	1949				1950				Percent change in amount from 1949
		Plants[b]	Amount tons	Value at plants		Plants[b]	Amount tons	Value at plants		
				Total	Av.			Total	Av.	
Industrial sands										
Glass sand	Commercial	3	932,307	$1,866,026	$2.00	3	1,034,639	$2,116,108	$2.05	+11.0
Steel molding sand	Commercial	12	674,467	1,235,450	1.83	10	850,492	1,637,386	1.93	+26.1
Blast, grinding and polishing sands	Commercial	2	81,612	256,661	3.14	2	83,900	279,162	3.33	+ 2.8
Engine and filter sands[c]	Commercial	2	19,856	42,571	2.14	2	17,755	38,711	2.18	−10.6
Other silica sand[d]	Commercial	3	268,878	710,785	2.64	3	320,526	853,411	2.66	+19.2
Total	Commercial	13	1,977,120	4,111,493	2.08	11	2,307,312	4,924,778	2.13	+16.7
Construction sands										
Structural sands	Commercial	—	13,002	26,843	2.06	—	15,345	33,522	2.18	+18.0
Total silica sand	Commercial	13	1,990,122	$4,138,336	$2.08	11	2,322,657	$4,958,300	$2.13	+16.7

[a] Summary of joint canvass made by Illinois Geological Survey and U. S. Bureau of Mines.
[b] Number of plants reporting production.
[c] Includes fire or furnace sand.
[d] Except sand ground for silica flour, which is given in table 38, "Ground Silica."

SILICA AND TRIPOLI

Ground Silica

Ground silica or silica flour is made by fine grinding of washed silica sand. During 1950 the quantity of this material sold or used by producers in Illinois amounted to 263,100 tons and was valued at the plants at $2,278,200, as shown in table 38. This was an increase of 20.9 percent in amount and 20.7 percent in value over the previous year. Illinois continued to rank first among the states in the production of ground silica. It is used as an abrasive, as a filler, and in foundries and in the ceramic industry where it is known as silica flour or "potter's flint." Ground silica for abrasives made up 31.4 percent of the total tonnage and 31.2 percent of the total value for 1950.

Tripoli

Tripoli ("amorphous" silica) is used as an abrasive, polish, filler, and for many other purposes. The tonnage and value of tripoli sold or used by producers in Illinois for 1948, 1949, and 1950 cannot be shown without revealing individual operations, as fewer than three producers reported sales of this mineral material. Figures for 1946 and 1947 are given in table 39.

Table 39.—Tripoli ("Amorphous" Silica) Sold or Used by Producers in Illinois, 1946–1950[a]

Year	Amount tons	Value at plants	
		Total	Average
1946	15,631	$321,600	$20.57
1947	14,687	314,075	21.38
1948	[b]	[b]	16.53
1949	[b]	[b]	19.05
1950	[b]	[b]	21.01

[a] Summary of joint canvass made by Illinois Geological Survey and U. S. Bureau of Mines.
[b] As less than three producers reported, production figures could not be shown without revealing individual operations.

Table 38.—Ground Silica Sold or Used by Producers in Illinois, 1949–1950[a]

Use	1948			1950			Percent change in amount from 1949
	Amount tons	Value at plants		Amount tons	Value at plants		
		Total	Average		Total	Average	
Abrasive	89,168	$ 777,712	$8.72	82,723	$ 711,203	$8.57	− 7.3
Enamel and glass	8,033	60,843	7.57	55,493	460,754	8.30	+ 31.4
Pottery, procelain, and tile	34,201	289,829	8.47	[b]	[b]	[b]	
Foundry and filler	37,282	335,033	8.99	48,357	349,218	7.22	+ 29.7
Other uses and undistributed	48,893	423,728	8.67	76,549	757,062	9.89	+ 56.6
Total	217,577	$1,887,145	$8.67	263,122	$2,278,237	$8.66	+ 20.9

[a] Summary of joint canvass made by Illinois Geological Survey and U. S. Bureau of Mines.
[b] Included in "Enamel and Glass."

FLUORSPAR INDUSTRY

Fluorspar the Mineral

Fluorspar is an attractive mineral, about as hard as glass and transparent or translucent. Crystallization, in the isometric system, usually takes the form of cubes. In color fluorspar varies from green to white, but also occurs in the yellow, blue, purple, pink, or brown hues.

Fluorspar is used chiefly in the iron and steel industry as a flux, for making a fluid slag, and freeing the iron from sulfur and phosphorus. From 5 to 8 pounds is used per ton of steel. Hydrofluoric acid, made from fluorspar, enters into the preparation of many chemicals, including those which play a part in the manufacture of high-octane gasoline, refrigerants, plastics, and insecticides. Fluorspar and its compounds are also used in the glass, enamel, and aluminum industries.

United States production (also Western Hemisphere) has come principally from the Illinois-Kentucky region that centers about Rosiclare, Hardin County, Illinois. These deposits extend across the Ohio River into Kentucky, which is the second largest fluorspar producer in the United States.

Production in 1950

The production of finished fluorspar in the United States in 1950 totaled 283,200 tons (including 146,600 tons of flotation concentrates), as compared with 236,400 tons in 1949. Although domestic production of finished fluorspar in 1950 was 20 percent greater than in 1949, shipments from mines exceeded production by 6 percent. The high level of operations in the steel and hydrofluoric acid industries and a substantial gain in consumer inventory were chiefly responsible for the accelerated activity in 1950 (table 40).

Shipments

Shipments of fluorspar from United States mines during 1950, totaling 301,203 tons, marked a gain of 27 percent over the 1949 shipments of 236,704 tons. The three states of Colorado, Montana, and Texas registered a drop in 1950 shipments as compared to 1949, while all other producing states increased their shipments, some substantially (table 41). It is interesting to note that Illinois and Kentucky together supplied 78 percent of the total domestic shipments for 1950.

Consumption

Consumption of fluorspar in the United States in 1950 established a new high of 426,121 tons; this is to be compared with the amount consumed in 1944 (410,170 tons) which marked the previous high-consumption period.

The steel industry, which set a new record in 1950, continued to be the foremost user of fluorspar by taking about 56 percent of the total consumed. The hydrofluoric acid industry, the second largest utilizer of fluorspar, consumed 29 percent of the total in 1950 compared with 26 percent for 1949. Of the domestic and foreign fluorspar consumed in the United States

Table 40.—Fluorspar Data for the United States, 1946–1950[a]
(In tons)

Year	Production	Shipments from mines	Imports	Consumption	Total industry stocks
1946	277,300	277,940	29,488	303,190	117,620
1947	343,700	329,484	78,379	376,138	147,251
1948	336,000	331,749	111,626	406,269	184,213
1949	236,400	236,704	95,619	345,221	167,660
1950	283,200	301,203	164,634	426,121	183,723

[a] Source: U. S. Bureau of Mines.

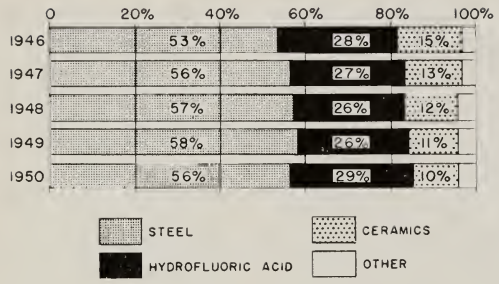

FIG. 19.—Percentage consumption of fluorspar (domestic and foreign) by industries, 1946–1950.

TABLE 41.—FLUORSPAR SHIPPED FROM MINES IN THE UNITED STATES, BY STATES, 1949–1950[a]

State	1949			1950		
	Tons	Value		Tons	Value	
		Total	Average		Total	Average
Colorado	22,324	$ 763,296	$34.19	18,182	$ 651,326	$35.82
Illinois	120,881	4,621,733	38.23	154,623	6,110,765	39.52
Kentucky	63,438	2,018,209	31.81	80,137	2,554,668	31.88
New Mexico	12,844	446,086	34.73	20,036	742,408	37.05
Utah	8,332	180,166	21.62	18,936	337,912	17.84
Other States:						
Arizona	846			952		
Montana	422			41		
Nevada	5,847	237,264	26.70	7,577	219,875	23.67
Texas	1,770			719		
Total	236,704	$8,266,754	$34.92	301,203	$10,616,954	$35.25

[a] Source: U. S. Bureau of Mines.

TABLE 42.—FLUORSPAR SHIPPED FROM MINES IN THE UNITED STATES, BY USES, 1949–1950[a]

Use	1949				1950			
	Quantity		Value		Quantity		Value	
	Percent of total	Tons	Total	Av.	Percent of total	Tons	Total	Av.
Steel	50.4	119,264	$3,555,743	$29.81	49.6	149,410	$ 4,384,271	$29.34
Iron foundry	1.3	3,103	103,061	33.21	1.3	3,945	134,929	34.20
Glass	11.7	27,727	1,043,512	37.64	10.1	30,450	1,176,994	38.65
Enamel	2.0	4,625	186,312	40.28	2.6	7,832	327,081	41.76
Hydrofluoric acid	29.9	70,759	2,991,166	42.27	32.4	97,659	4,164,901	42.65
Miscellaneous	4.4	10,443	354,439	33.94	3.7	11,179	399,032	35.69
Exported	0.3	783	32,521	41.53	0.3	728	29,746	40.86
Total	100.0	236,704	$8,266,754	$34.92	100.0	301,203	$10,616,954	$35.25

[a] Source: U. S. Bureau of Mines.

the glass and enamel industries in 1950 used a smaller percentage of the total than in 1949, although their tonnage increased by about 13 percent over 1949 (table 43).

Imports

Imports of fluorspar in the United States during 1950 came to 164,634 tons, which established a new record; the previous high was in 1948 when the U. S. imported 111,626 tons. Mexico continued to be the chief source of imports, supplying about 44 percent of the total for 1950. The sum of 73,051 tons is an increase of 25 percent over the 1949 imports from Mexico (table 44). Of considerable importance is the amount of fluorspar supplied by both Germany and Spain during 1950.

Stocks

Stocks of fluorspar at domestic mines at the close of 1950 totaled 75,090 tons (121,516 tons in 1949). There were 19,038 tons of finished and 56,052 tons of crude fluorspar (calculated to be equivalent to 27,000 tons of finished fluorspar).

Fluorspar in Illinois

During 1950 Illinois maintained its position as the leading fluorspar producer in the United States. Shipments from Illinois mines throughout the year amounted to 154,623 tons, which was slightly over 51 percent of the total amount shipped from all producing states. The 1950 shipments of fluorspar from Illinois mines showed a marked increase (28 percent) over the amount shipped in 1949 (table 41). However, the year 1943 still stands as the high point of activity in the Illinois industry when 198,789 tons were shipped from mines.

The average price of Illinois fluorspar increased from $38.23 per ton in 1949 to $39.52 per ton in 1950. This is an increase of about 3.4 percent over the 1949 average price. The above-listed prices for Illinois fluorspar are substantially higher than the United States average price as shown in table 41. The average selling price of all grades of domestic fluorspar shipped in 1950 established a new high over the previous peak of 1949.

Table 43.—Consumption of Fluorspar (Domestic and Foreign) in the United States, by Industries, 1946–1950[a]

(In tons)

Year	Steel	Hydrofluoric acid	Glass	Enamel	All other	Total
1946	160,735	83,901	39,852	6,739	11,963	303,190
1947	209,395	100,363	42,130	8,938	15,312	376,138
1948	232,687	107,280	37,247	8,871	20,184	406,269
1949	201,501	89,152	30,797	5,510	18,261	345,221
1950	240,802	124,440	33,440	7,723	19,716	426,121

[a] Source: U. S. Bureau of Mines.

Table 44.—United States Imports of Fluorspar, 1949–1950[a]

Country	1949		1950	
	Tons	Value	Tons	Value
Canada Newfoundland	15,344	$ 361,623	14,163	$ 426,120
France	1,532	27,800	2,772	30,522
Germany	—	—	29,624	527,277
Italy	7,857	130,362	9,722	200,594
Mexico	58,238	828,901	73,051	893,545
Spain	12,648	200,358	35,302	501,609
Total	95,619	$1,549,044	164,634	$2,579,667

[a] Source: U. S. Bureau of Mines.

PLANT FOOD MATERIALS

Producing bountiful crops in the early days of agriculture was, essentially, only a matter of preparing the seedbed, planting, cultivating, and harvesting. Today, however, the situation is different. In order successfully to maintain high crop production in the face of declining soil fertility, man must make every effort to maintain in the soil the nutrients or plant foods that have been lost or extracted.

If left alone, nature does a pretty good job of maintaining a balanced soil fertility; but where man's exploitation has interfered, these balances are usually upset. Therefore, in order to keep soils from becoming very poor or useless, it is necessary to add fertilizer materials. Any substance applied to the soil for the purpose of maintaining or increasing plant growth constitutes a fertilizer. Some fertilizing materials, such as nitrogen, phosphorous, and potassium, are carriers of the major plant nutrients, while other fertilizers act to modify the physical or chemical composition of the soil. Limestone, for example, is usually applied for the purpose of correcting acidity, but at the same time it is a source of calcium and magnesium, also essential plant food elements.

Substantial quantities of potassium are found principally in the roots, stalks, stems, and leaves of plants. Corn, in crop rotation, is usually the first to show the effects of a potassium deficiency. While the supply of potassium is reasonably good in most Illinois soils, the rate at which it becomes available is often too slow for maximum crop yields. In other words, our crops in Illinois and in the corn belt are not growing on nutrients that are released each year, but rather they are feeding from supplies which have built up during past centuries. It has been calculated that the weathering rate of the potash minerals in Illinois soils (based on unweathered loess deposited about 50,000 years ago) has amounted to only one-fifth of a pound of released potassium per acre per year for every 6⅔ inches or 2,000,000 pounds of soil. As these elements are taken from the soil by the crops, which are finally consumed in distant urban centers, fertility is gradually declining—more slowly where the soil has abundant supplies of unweathered minerals, but as surely declining.

Because we human beings depend on food to supply us with all the essentials for growth and health, the present generation of farmers and city dwellers alike must realize that the crop rotations which resulted in good yields in our fathers' and grandfathers' time will not keep production high now or in the future unless the supply of minerals in the soils is restored and maintained.

Potash Deliveries

During 1949 potash was delivered in this country to 45 states and the District of Columbia. Ohio was the leading state in potash deliveries with over 90,000 tons K_2O, and was followed by the states of Georgia, Illinois, North Carolina, Virginia, and Florida, each taking more than 60,000 tons K_2O for the year.

By far the most popular material for agricultural purposes continues to be the 60 percent muriate of potash, comprising about 80 percent of the total K_2O delivered. The 50 percent muriate of potash accounted for 8 percent, manure salts 4 percent, and sulfate of potash and sulfate of potash-magnesia 7 percent of the deliveries.

Table 45 lists the ten states leading in use of agricultural potash for the year 1949. As indicated in this table, the ten leading states account for two-thirds of the agricultural potash deliveries. However, in 1945 the first ten states took almost 72 percent of the agricultural potash.

The trend over the period 1945–1949 shows a general increase in the use of agricultural potash for the country as a whole. The first ten states also have been using more of this material, but percentagewise their share is decreasing, indicating a growing demand for this plant food in other areas.

TABLE 45.—TEN STATES LEADING IN USE OF AGRICULTURAL POTASH, 1949[a]
(In tons)

State	Rank among states	Tons
Alabama	10	42,333
Florida	6	62,226
Georgia	2	83,192
Illinois	3	78,547
Indiana	7	56,471
Maryland	9	47,168
North Carolina	4	67,045
Ohio	1	90,688
South Carolina	8	47,660
Virginia	5	64,645
Total, 10 states		639,975
Total U. S. deliveries		972,154
Ten states as a percent of U. S. total		65.8
Number of states using potash, 1949[b]		46

[a]Source: American Potash Institute.
[b]Includes District of Columbia.

TABLE 46.—AGRICULTURAL POTASH DELIVERIES IN UPPER MISSISSIPPI VALLEY STATES, 1949[a]

State	Tons
Illinois	78,547
Indiana	56,471
Iowa	13,551
Minnesota	16,634
Missouri	13,632
Wisconsin	25,707
Total, six states	204,542
Total U. S. deliveries	972,154
Six states as a percent of U. S. total	21.0

[a]Source: American Potash Institute.

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